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CITY ENGINEER'S OFFICE RECORDS

Compiling and Filing Data and Daily Accounts of Work Accomplished—Ledger Records—Quantity Estimates—
Filing and Indexing Maps and Records—Note Books—Maps for Recording Data.

BY JOHN McNEAL, M. AM. SOC. C. E.*

The following outlines and description of office records in the office of a city engineer (applying more particularly to cities having a population of from 30,000 to 100,000) have been prepared with a view to assisting, in a small way, the city engineer of little experience, by explaining how the data and daily accounts of work accomplished can be so compiled and filed that they will at all times be readily accessible for reference and reports.

The city engineer who waits until the end of the year to compile the data for his annual report finds himself buried in a mass of financial and other information from which it is difficult to readily compile an intelligent report.

Daily systematic records may be kept with surprising ease, no matter what the nature of the work may be, and the call for a report can then be met without special effort and at a great saving in time. These records do not require a large office force for systematic compilation; on the other hand, the engineer himself can frequently compile the records by taking a few minutes each day for that purpose, thus keeping himself in actual touch with practically all the details, covering purchase of supplies, contract or city force construction, and surveys, as well as the many details which come under his jurisdiction.

COST ACCOUNTING.

Considering first the question of cost accounting: The accounting records of an engineer's office should be kept in practically the same manner as methods employed by up-to-date contractors. The city engineer is, in a measure, the municipality's contractor, superintendent or manager and although it is recognized that a municipality may be a monopolistic corporation, it should nevertheless be the duty of the manager to so conduct his business that a balance in the work which he personally conducts should be shown on the proper side of the ledger, or in other words, that the work should be handled in such a way that the ordinary profit usually accruing to a contractor would be saved on the city's work. It is my opinion that a municipality should do only that work for which the regular force it maintains is especially adapted, leaving work which requires a contractor's plant and organized force to open bidding to be awarded at legitimate figures.

The accounting records should be compiled from the following:

1. Daily reports of work accomplished.
2. Ledger records.
3. Quantity estimates.
4. Compiled results.

Considering these different items in their order:

*City Engineer of Columbia, S. C.

1. The daily report blanks should be arranged with the greatest simplicity, as they are frequently filled in by men of little experience in preparing reports of any kind. As an example of a daily report of street work done by this city, a blank form for showing the distribution of the regular force engaged on street maintenance and street cleaning is arranged with the following heads:

Condition of weather. Date.

Extra Work (several lines left for description).

Chain Gang—Total No. of men. Sick. Distribution.

Wagon Force—No. of wagons. Distribution.

Special Squad—No. of men. Distribution.

Street Cleaning—No. of men. District covered. Remarks.

Street Sprinkling—District covered.

Purchases—Supplies. Tools. Remarks.

Signature of foreman.

This report is filled out in detail each day by the foreman in charge of the work and accounts for each laborer and team in his employ. Machinery for street work, such as gasoline and steam traction engines, road rollers, etc., are also covered in these daily reports, from which can be determined at a glance the location and extent of the daily work. The location of street surface swept and sweepings collected is also embodied in the daily report showing the streets cleaned both by hand and machine sweeping.

Reports of an equally simple form are prepared for each class of work, such as underground drains, repairs to paved streets, and in fact work of every description done by the city force.

2. Ledger records are entered from the bills presented for payment. All bills should be accounted for from orders issued from the engineer's office. Promiscuous purchases of small materials should not be permitted without orders. All bills should be checked off item for item from the duplicate orders on file and entered in the ledger against their respective accounts, and the engineer's records will then run parallel with the treasurer's account and duplication or errors in bills will be impossible. It is assumed that bills will not be recognized by the treasurer without the engineer's O. K., thus guaranteeing an exact accounting for each expenditure and its entry against the proper account. If this system is not strictly adhered to, the engineer's record will be woefully lacking in accuracy. Bills rendered will include feed for stock, repairs of all kinds connected with the equipment used by the department, supplies of every description both for new work and repairs.

It might seem that an undue amount of labor and time would be required for the entry of these bills in the ledger, but by systematic distribution of the accounts while scrutinizing the bills, the engineer will be surprised at the ease with which they can be compiled, and entries should be made as they are presented for payment.

3. Quantity estimates must necessarily be made for each piece of work to determine its daily or final cost. These are compiled from measurements of the work as it progresses and are filed for reference to be used upon completion of the work. The bills rendered and recorded will show the amount of stone, sand, cement, pipe, etc., used on each construction, from which estimates may be prepared showing whether or not the material has been wasted on any certain job. Wastes of material, on concrete work especially, are readily detected by these methods. The feeding of stock and food maintenance for chain gangs or other laboring force are also kept within proper limits by comparative records.

4. The compiled results are taken from a summary of the previous items. The daily reports are compiled in condensed form on monthly report forms arranged for the purpose. The engineer should compile these daily, a few minutes each day only being necessary for the work. These reports show the number of men and teams employed on the several jobs, the extent of the work, such as the streets repaired, square yards of surface cleaned or swept, pipe laid, areas covered by machines in road work, supplies used such as coal, oil, gasoline, etc. in the operation of the machines. From all of which, monthly or annual reports may be prepared showing every item in detail.

Comparison with former records will also determine the efficiency factor for which every engineer should strive, and reveal the greatest accomplishment at the least cost.

FILING MAPS AND RECORDS.

The Surveying Department of a city engineer's office demands the same systematic compilation of the maps and records. Note books should be properly indexed and a card index file made of each record. The note books may readily be indexed at odd times by the engineer's helpers and cards made out by the same force. A little instruction in this direction from the engineer will soon develop efficiency on the part of the assistants.

Each map, plan or profile should have its proper index card and be filed in a filing cabinet arranged for the purpose. Steel filing cabinets are used by this office for index, note books and correspondence. A cabinet with drawers of proper size for laying the maps flat or for rolled profiles should be procured for the purpose. A drafting table 3 feet 6 inches by 6 feet, with sets of drawers underneath will be found quite well adapted for a small office. The card index should be placed in a convenient location for ready reference.

Drawer	Map	Gervais Street
10	105	Gervais street—Profile Sumter to Gist streets.
3	127	Gervais street—proposed roadway from Barnwell to Harden streets.
3	123	Gervais street—profile from Barnwell to Harden streets.
3	119	Gervais street—profile from Pulaski to Huger streets.

CARD FOR INDEXING PROFILES.

	Gregg Street	Book	Page
Gervais to Senate—line and grade for sidewalk and curb	No. 3 B. L. grade and curb	20	
Gervais to Senate streets—levels	Gen. Sur. 9	60	
Elevation of drains at Calhoun and Gregg	S. Drain 2	12	
Pendleton to Green—levels	Gen. Sur. 1	3	
S. W. Cor. Gregg and College—location of building line	Grade 2	59	

CARD FOR INDEXING FIELD NOTES

Samples of the card index files are shown, showing the methods used in indexing the field notes and profiles.

Different colored cards are used for maps and profiles, storm drains index, sanitary sewers, and plans connected with the water works.

The following further details as to note books, records, etc., have been adopted in this office:

A separate field note book is used for recording surveys of each of various kinds, such as curb, building lines and grades, storm water drains, sanitary sewers, topographical surveys and miscellaneous surveys. These surveys are given separate indexes on each card, and the note books are each given a separate number, marked in water proof ink on the outside leather cover of the books, an index of the contents of each book being made on the first few pages of the book.

On certain classes of surveys, such as curb and building lines, the original notes in the field book are used as a permanent record, references thereto being made through the card index; other records, of course, are plotted on maps or profiles for permanent record.

The exact locations of all sewers, water mains, fire hydrants, water main valves and sanitary sewer connections are plotted on maps from the field note records, and maps of each section filed for record. In addition to these records we have also filed on some streets other underground structures, such as telephone conduits and gas mains.

A grade book map which has been found very useful for field work has been prepared showing a plan of the entire city in sections 7 inches by 4 inches, drawn to a scale of 300 feet to the inch. This book was prepared from a series of blue prints which were cut in such a way that every city block in the city was shown. All the established grades for the city are shown in this section book, which is of convenient size for pocket use. This makes it unnecessary for the engineer corps to return to the office for information in various parts of the city. The blue prints were cut in proper sizes and a margin at the top left for binding in a flexible leather cover.

For filing, maps are marked with a rubber stamp "Drawer No. —," and on this is marked the number of the drawer and the number of the map, thus, "Drawer No. 6—105." The numbers of the maps start at one hundred in order that the map number will not be confused with the drawer number.* These marks are placed on the corner of the back of each tracing, blue print or map and on the outside of the roll of profiles; in addition to this we place on the back of each roll of profiles a type-written list of the streets included in the roll.

We do not use a standard size for our maps or plans, as we find it necessary to adjust the size of the plan to its use. Profiles are kept in rolls of convenient length and these rolls are filed in the filing drawers, as many rolls being placed in each drawer as its length will allow. Drawers in our filing case are 31 inches by 31 inches by 3 inches deep.

While it may be better for the plans and tracings to be laid out flat in the drawers, on account of the variations in size we find it much more convenient to refer to them when filed in rolls. This method, however, does not allow filing as many maps per drawer as the flat system would permit.

Copies of specifications and contracts awarded are kept in a filing cabinet, as well as bids submitted by contractors on all work. Street paving petitions and reports are also filed in a similar manner.

*Another plan is to combine map number and drawer number. Thus, this map would be marked simply "No. 605," the 6 giving the drawer number. No. 312 would be map 12 in drawer 3. Editor.

PRACTICAL STREET CONSTRUCTION—STREET WIDTHS

Various Kinds of Traffic to Be Accommodated—Calculating Roadway Widths for Main Thorofares—Width Required for Each Traffic Line—Separate Street Railway Strips—Minor Thorofares.

So far as its use for carrying traffic is concerned, the proper width of a street is determined by the demands of the particular kind or kinds of traffic which it is designed to or may at any time be called upon to carry. In general the traffic may be divided into vehicular and pedestrian, while the former may be sub-divided into a number of classifications, prominent among which would be street railway cars; light, rapidly moving vehicles, and heavy, slowly moving vehicles. In the ancient cities the number of vehicles was so small relative to those which use the city streets of today that no special provision was made for them, but the entire roadway width was used in common by vehicles, beasts of burden and pedestrians. In country districts the same is still true. As we approach a village or other settled section, a foot path is usually found developed more or less continuously along the side of the road, and becoming more and more prominent and distinct from the roadway, until in the built-up and paved portion of the city we find the foot paths or sidewalks separated from the roadway by distinct lines and construction.

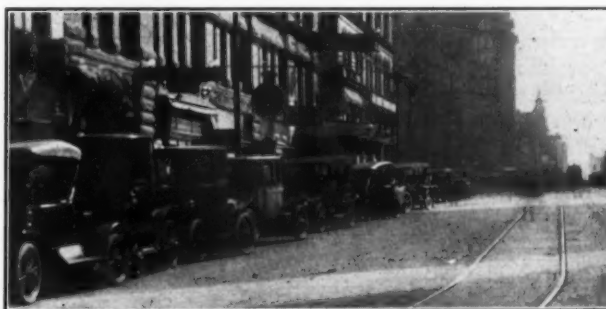
In some cases the division of roadway width is carried still further, and a separate strip is set apart for a street railway and used exclusively by it, although in the majority of cases the street railway strip is used more or less generally by the general vehicular traffic. In other instances we find special roadway strips set apart for fast and for slow moving vehicles, as bridle paths, bicycle paths and occasionally for other purposes.

Probably an ideal street so far as through traffic is concerned would be one which has separate ways provided for each class of traffic, each separated from all the others in such a way that there will be no trespassing by any class of vehicle on the ways assigned to other classes. This, however, would add to the width demanded and would, in very few cases, be justified by advantages secured. For instance, in the city of small or medium size, it may usually be that a street railway track at any given point is passed over by a car only once in five to fifteen minutes, and during the intervals between such use there would seem to be no good reason why it could not be used by other vehicles. The chief objection to this would be the delay in speed of the surface car and danger to vehicles resulting from the practice, and in a number of instances thorofares leading out from the city and carrying interurban lines have been constructed with a special strip for the street railway, separated from the remainder of the street by a curb or other obstruction.

As to the separation of vehicular and pedestrian traffic, where there is any considerable amount of both the interference of each with the other is so serious that there is universal agreement upon the desirability of such separation. There is a question, however, whether in the case of certain minor residence streets or others which are traversed by very few vehicles, the sidewalk might not be omitted and the same pavement used for both vehicles and pedestrians. The principal objection to this is found at such times as the roadway is covered with snow or becomes muddy, since it is difficult to clean or to keep clean a strip for the pedestrians if it is being used several times a day by vehicles.

ROADWAY WIDTHS FOR MAIN THOROFARES.

Considering first the roadway of a main thorofare, we find the following elements of the problem: In the central part of the retail district there will be a great many vehicles standing still for several minutes at a time and some provision must be made for these. The



Courtesy, U. S. Wood Preserving Co.
PARKING AUTOMOBILES ALONG CURB. GRISWOLD ST.,
DETROIT.

most convenient point for them is close to the footway, since those riding in the vehicle ordinarily wish to alight from or enter the vehicle and to find ready access to the buildings facing the stopping point. In such section of the city it is therefore most important that we allow for a more or less continuous line of vehicles standing along the curb. Where sufficient space is not available along the curbs for all of the vehicles which wish to stand for a few minutes or hours in the business part of the city (and the number of such has been found to be increasing very rapidly with the advent of the automobile), it has been found necessary to provide what are known as parking places for leaving automobiles, these being located as near to the traffic center as possible. This matter will be considered later.



Courtesy, Granite Paving Block Mfrs. Ass'n.
STREET RAILWAY STRIP SEPARATED FROM ROADWAYS BY CURB, NEWARK TURNPIKE.

With a line of vehicles standing along each side of the roadway, we require, next, room for one line moving in each direction between these. (In the case of narrow streets where sufficient width for these two lines is not available, it is becoming common to establish these as "one way" streets, or those in which traffic is allowed to move in one direction only.) If the traffic moving through the street is such as to give an almost continuous line in each direction, then the entire line must move at the uniform rate of the slowest vehicle. Where, however, the vehicles in either line of motion are spaced at an average of more than, say, 150 to 200 feet apart, a vehicle desiring to pass another in the same line can do so when it comes opposite a break in the line moving in the opposite direction. There is, of course, danger that an attempt to do so will be made when the break in the other line is too short to permit of it safely, and collision between vehicles moving in opposite directions may be more or less common. In a street of comparatively light traffic, however, where vehicles are seldom found less than a half block or a block apart, the slight inconvenience caused by such condition hardly warrants the expense of providing additional space for turning out. Turning out to pass will be considerably more convenient and safe, however, if a fifth strip be left in the middle of the roadway.

In a street with heavy traffic, it should be possible for the more rapidly moving vehicles to turn out of the line of the more slowly moving without danger of a collision, and in fact, provision should be made for two lines of vehicles, one traveling slowly and the other more rapidly, moving in each direction. This gives us six lines of vehicles, and it is seldom that more space is pro-

vided where only free moving vehicles (those not confined to street railway tracks) are concerned. Upon Fifth avenue, New York, one of the most heavily traveled streets in the country, there is room for six lines of vehicles and the drivers follow these lines quite closely.

Where there is a street railway in the street, separate provision should be made for this also if the cars pass at intervals of less than say two to four minutes. Where the passage of cars is infrequent, however, it is common for the rapidly moving free traffic in the center of the roadway to use the railway strip. This results in retarding the average speed of the street railway cars so long as they are in a main thoroughfare where the six lines of traffic are used to anything like their full capacity; since where this is the case the vehicles using the car tracks cannot leave them except by infringing upon the traffic strip allotted to the slowly moving vehicles or by turning into a cross street. It is, therefore, very desirable in a main thoroughfare which carries almost continuous traffic on each of the four lines described, and through which travel cars convening from several tributary lines of track into one trunk line near the center of the city, that a special strip be provided for the tracks.

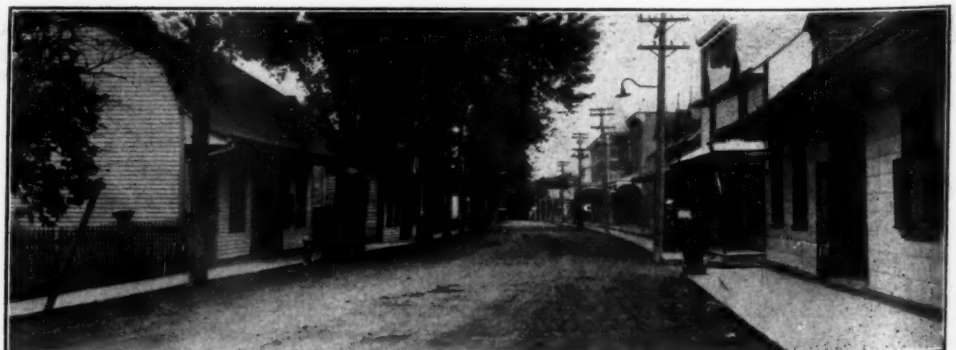


Courtesy, Barber Asphalt Paving Co.



Courtesy, U. S. Wood Preserving Co.

The roadway above—Adams St., Chicago, is too narrow for two vehicles to pass between curb and double track, but would be wide enough for two on one side and one on the other if the tracks were moved out of the center. At the right is a street in Pointe Claire, Canada, carrying considerable traffic, 40 feet between curbs (probably ample), but with very narrow and obstructed sidewalks and no opportunity for expansion.



Above is shown a typical main business street of a small city (Genesee St., Saginaw, Mich.) in a section where wide streets are the rule. Here there is ample room between the curb and car tracks on each side for two vehicles to pass, and possibly to pass a third standing at the curb. A part of the side-wide also is obstructed by "parking space" for semi-vehicles—bicycles—but apparently has ample width for this.

As described in the March 9th issue, the vehicles using the streets of New York City (and the dimensions of those to be found in other cities probably will not vary considerably from these) have widths from out to out varying from about 6 feet to 8 feet 6 inches, averaging about $6\frac{1}{2}$ or 7 feet. It is considered that 12 inches is about the minimum clearance which should be left between vehicles, giving a width to be allotted to an average vehicle of $7\frac{1}{2}$ or 8 feet. Quite a number of designers have used 8 feet as the width of strip to be provided for each line of vehicles; but with the increasing number of automobiles and especially with trucks running from 7 to $8\frac{1}{2}$ feet in width, the present tendency is to adopt 9 feet instead. In view of the fact that these widths are being used in providing for future conditions and the probability that vehicles will average wider in the future rather than narrower, it would seem more safe to use the 9 foot width as a unit.

For street railway cars also Mr. Hutchins recommended 9 feet, but many others have used 10 feet as the width for a single track and 20 feet for double track; and considering the speed at which these travel and the fact that they are fixed in their line of motion and cannot diverge from it to pass any obstacle, the greater width would seem safer.

Using these units of 9 feet and 10 feet, we obtain the following results: For one line of vehicles along each curb and one line moving in each direction, 36 feet; or 45 feet if a middle strip be left for turning out. For one line along each curb and two lines moving in each direction, 54 feet. For the same with additional provision for a double track, 74 feet.

The problem so stated would seem to be extremely simple, the important point being a decision as to how many lines of vehicles to allow for. If the thorofare is near the business center of the city and provision is to be made for a city of any considerable size, there would

width for this purpose, and the two lines of vehicles in each direction, with or without the single or double railway track, would seem to suffice for these requirements.

It is, of course, considered that, except for the street railway cars, the vehicles are not confined to any one line but can swing around obstructions and the two lines can merge into one for short distances where necessary. Where the thorofare in question parallels a main thorofare which carries street railway tracks, the parallel or auxiliary thorofare being used for free ve-



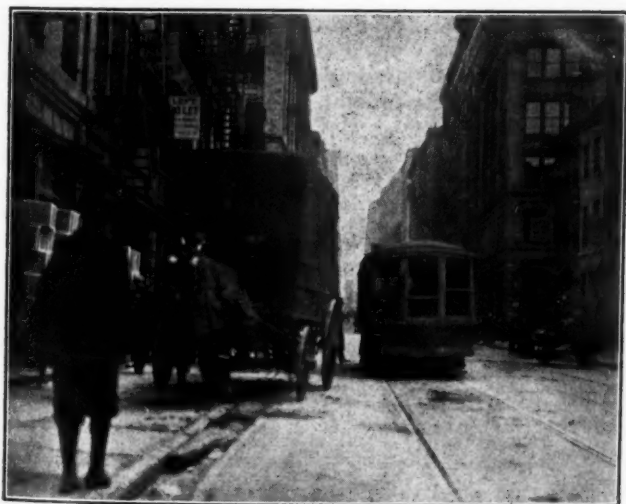
Courtesy U. S. Wood Preserving Co.
TEAM TURNING ONTO CAR TRACK TO PASS ANOTHER.
LOWER BROADWAY, NEW YORK.

hicles entirely, provision for four lines of traffic alone would seem to be sufficient, giving a 36-foot roadway.

The above refers to general traffic. Where the road is used largely for hauling freight, leading to a freight station or wholesale or manufacturing district, the same considerations apply, except that the distinction between slowly and rapidly moving vehicles is ordinarily greater, and it is not so easy for the former to swing out from the general line of traffic to pass obstacles or to make way for other vehicles. Moreover, the trucks and other heavy vehicles using these thorofares will probably average wider than the miscellaneous vehicles using the general main thorofare. On the other hand, however, slowly moving vehicles do not need so wide a clearance between lines of traffic to prevent collisions, and occasional interferences of wheel hubs are not so serious, and the unit width employed for other traffic will probably be sufficient for this also.

In the above the average vehicle width is that considered rather than the maximum, but it should be remembered that the maximum will be infrequent and that the vehicles are free to move out of the straight line of travel and turn out a few inches now on one side and now on another and thus accommodate themselves to inequalities and exceptional extremes.

When we come to the minor thorofares, where it is seldom that more than one or two vehicles will be found moving at a given time in one direction within the limits of a given block, it might be considered unnecessary to provide more than one line of traffic in each direction; but in this case a somewhat more liberal allowance should be made to provide for extremely wide vehicles, for those which wish to turn around, or for an occasional vehicle standing parallel to or backed up against the curb. An average coal wagon backed up against a curb, but with the horse turned parallel therewith, will ordinarily extend for $11\frac{1}{2}$ to 13 feet from the curb, measured over all. A moving van is frequently longer, but is generally set so as to overhang further beyond the rear wheels and 15 feet is ordinarily sufficient allowance to make for these. Owing to the infrequency of these in a thorofare such as we are now considering, it would seem to be sufficient to provide only for one line of vehicles to pass between such van and the oppo-



WAGON STANDING PARTLY ON SIDEWALK BECAUSE
OF NARROW ROADWAY AND PRESENCE OF
STREET CAR TRACKS.

seem to be little question that the largest dimension given, allowing for six lines of vehicles and a double track, should be provided.

A few blocks away from the business center a thorofare will probably need to carry as much or perhaps even more moving traffic, but the street at this point is generally lined with residences rather than with retail stores and it is only occasionally that vehicles will desire to stand along the curb. In this part of the thorofare the comparative infrequency of the standing vehicle would not seem to warrant the provision of a special

site side of the roadway, this giving us a total width of 22 to 24 feet. As the width of 24 feet is also sufficient to permit two lines of vehicles to pass a third drawn up to the curb if we use the unit width of 8 feet which some advocate and which is probably ample if both use care in passing, this width would seem to be ample for a thoroughfare of this description. In many small cities the traffic even to the center of the city will be sufficiently accommodated by this width, although it is much better to provide for two lines of moving vehicles, or 36 feet, in the streets at the business center of even the smallest city.

This discussion refers to main and secondary thoroughfares only and not to minor residence streets. These last will be considered in a future instalment.

SNOW REMOVAL METHODS.*

The annual mean snow fall varies from about 20 inches in the vicinity of 39° North Latitude to about 60 inches at 43° North Latitude. We find that the maximum snow fall for a single storm seldom exceeds 18 inches and rarely reaches that depth.

The conditions relative to labor and equipment during the winter months average about as follows: At the customary wage the number of men that can be secured, included the regular street cleaning force, is about 2½ to 4 per 1,000 population; teams with drivers, 1 to 2 per 1,000 population. The smaller the city the greater the number of teams available in proportion to the population. It is seldom that the maximum number of men and teams can be secured before the second day after the storm.

The mileage of streets from which snow removal is required is quite generally from one-half to one mile per 10,000 population, not including the streets customarily cleaned by street railway companies.

Practically all snow removed is shovelled by hand into trucks or street railway freight cars and hauled to the nearest dump or large sewer. I have failed to find that any of the smaller cities have tried to any extent to remove the snow as it fell by scraping it into the sewer manholes. Often the work of snow removal is not begun until the snow fall ceases. Sometimes this is a mistake. A number of cities are dumping snow from trucks through the manholes into large trunk and interceptor sewers, but are sceptical about using the smaller sewers, some having previously had trouble from this source of disposal.

With the proportionate number of men and teams

*Abstract of paper entitled "Methods of Snow Removal Suitable for Municipalities Having Populations of Less Than 200,000," presented by Leon F. Peck, superintendent of streets, Hartford, Conn., at the Snow Removal Conference on March 8, 1916. The proceedings of this conference will be printed by the National Highways Association.

available as previously given, these cities would have (exclusive of the regular street cleaning force which are needed for cross walks) approximately 25 men and 15 teams for each mile of street to be cleared. With the customary short hauls, such a force could take care of a heavy snow fall for from 12 cents to 30 cents per cubic yard, and in a manner generally satisfactory in cities of less than 200,000 population. Usually the larger the city, the more exacting the requirements.

The maximum snow expenditures for a winter in any of these municipalities rarely exceeds \$30,000.

The following methods are suitable for the class of cities under consideration:

Co-operation of city departments is important.

Emergency work should be done under direct control of the city on a day labor basis, rather than by contract.

Teams and trucks can be secured by telephone or messengers from list of owners on file.

In order to secure extra men, the foreman can train the regular street cleaners under him to send all the men they can to gang-organizing headquarters whenever their experience tells them that extra men will be needed.

Emergency foremen should be selected from the list of regular city foremen and inspectors of repairs, road construction, grading, street sprinkling, street lighting, forestry, etc., who are all or in part usually under the one street department responsible for the snow removal.

ADDITIONAL PAVING DATA.

We give tabulated herewith the data concerning street paving which has reached us since the publication of the tables in our February 3rd issue. We learn that in Detroit, Mich., in addition to the 4,469 sq. yds. of creosoted wood block pavement reported, which was all new paving, the city resurfaced 176,613 sq. yds. with this material and repaved 1,349 sq. yds. with creosoted block, making a total of 182,431 sq. yds. Additional figures for wood block were furnished by the Southern Pine Association as given in Table No. 1, and in addition the association states creosoted wood blocks, not given in our table, were laid in the following cities in 1915 (quantities not given):

Houston, Texas; Seattle, Wash.; Kansas City, Mo.; Joplin, Mo.; Atlanta, Ga.; Chattanooga, Tenn.; Memphis, Tenn.; Bangor, Me.; Bloomington, Ind.; Peoria, Ill.; Richmond, Ind.; Findlay, O.; Manitowoc, Wis.; Duluth, Minn.; Hamilton, Ontario; Philadelphia, Pa.; Hartford, Conn.; Worcester, Mass.; Fort Wayne, Ind.; Cumberland, Md.; Binghamton, N. Y., (bridge); Lebanon, O., (bridge); Ottawa, Ont.; Excelsior, Minn.; Springfield, Mo.; Granite City, Ill.; Denver, Col., (viaduct); Bowling Green, O., (bridge); Brookline, Mass.; Keokuk, Ia., (bridge); Atlantic City, N. J.; Grand Rapids, O., (bridge);

TABLE 2B—CONSTRUCTION DETAILS AND COSTS OF PAVEMENTS.

	Courses	Concrete		Concrete with bit. top cost	Bitulithic cost	Bituminous concrete		Bituminous macadam		Water bound macadam cost	Gravel cost
		Thickness	Cost			Thickness	Cost	Thickness	cost		
California:											
Glendale							\$1.17cga	4	\$0.43		
Florida:											
Live Oak										\$0.20	
Indiana:											
Rushville..... two		7	\$1.11								
Illinois:											
Calro											\$.63c
Kansas:											
Fredonia	two	6	.95c								.42cd
Kansas City .. one		6	.94c	\$1.625e	\$1.89						
Michigan:											
Dowagiac two		6	1.00								
New Jersey:											
Jersey City						2½	.95f				
New York:											
Gouverneur40b	.30b	.28gh
Washington:											
Elna							1.04bl				

a—modified Topeka; c—by contract; d—oiled; e—hassam; f—laid on macadam base; g—grading included; h—bituminous macadam resurfacing; l—grading cost 6 cents per sq. yd.

TABLE NO. 1—PAVEMENTS LAID IN 1915.

	Sheet asphalt	Asphalt block	Granite or stone block	Brick or clay block	Crescoted wood block	Concrete	Concrete bit. top	Bitumtlie	Bituminous concrete	Bituminous macadam	Water bound macadam	Gravel	Other kinds
California:													
Glendale									20,000a	86,781	2 ml.		
Florida:													
Live Oak													
Sanford				17,400									
Georgia:													
Atlanta										35,000b			
Illinois:													
Chicago				2,000h								30,111h	
Indiana:													
Rushville				3,591		1,805							
Kansas:													
Arkansas City				43,912									
Frederick				12,000		17,000							
Kansas City	49,100			19,100		42,400		14,500					39,600d
Michigan:													
Dowagiac						17,500							
Hamtramck						47,209							
Mississippi:													
Jackson					1,000b								
Missouri:													
Joplin					5,000b								
Kansas City					50,000b								
New Jersey:													
Jersey City	2,374	2,616	11,679	19,027	7,271				58,549	4,236	1,000		35,571e
New York:													
Gouverneur													2,140f
Ohio:													
Canton	1.7 ml.			10.6 ml.									
Oregon:													
Astoria				3,476i									
Pennsylvania:													
Edwardsville				3,000									
Luzerne				1,200									
Wilkes-Barre Twp.				2,000									
Wilkes-Barre				2,300									628g
Tennessee:													
Chattanooga					22,000b								
Memphis					15,000b								
Texas:													
Galveston					6,000b								
Houston					9,000b								
Washington:													
Elma													
Seattle				171,536i					37,000				

a—modified Topeka; b—data furnished by Southern Pine Association; c—olled; d—Hassam; e—belgian block; f—resurfacing; g—brick, slag base. h—by contract. i—data furnished by Denny-Renton Clay & Coal Co.

TABLE NO. 2A—CONSTRUCTION DETAILS AND COSTS OF PAVEMENTS.

	Thickness of surface	Sheet Asphalt Thickness of binder	Asphalt Block Cost per sq. yd.	Granite or other Stone Block Kind of filler	Brick or Clay Kind of filler	Block Cost per sq. yd.	Depth of Cushion	Kind of filler	Block Cost per sq. yd.	Preserved-Preseva-tive	Crescoted Wood Block Cost per sq. yd.
Florida:											
Sanford							2	sand	\$1.40m		
Illinois:									1.50c		
Chicago							1½	grout	\$2.00b		
Indiana:							1½	grout	1.71b		
Rushville							1½	asphalt	1.81bc		
Kansas:							1½	asphalt	1.38cb		
Arkansas City							1½	asphalt	1.43b		
Frederick							1½	cement			
Kansas City	2a		\$1.64b					grout	2.11cb		\$2.46cbg
New Jersey:											
Jersey City	2	1-1½	1.98c	\$1.96cbg	tar	\$3.29cbg	1	pitch, grout mastic	1.53cb		
Ohio:											
Canton	2-1½	1½	1.87cb				1				
Pennsylvania:											
Edwardsville							1½	grout	2.13cbg		
Luzerne							1½	grout	2.45cbg		
Wilkes-Barre Twp.							1½	grout	1.90cb		2.88cb
Wilkes-Barre											

a—rock asphalt; b—includes base; c—by contract; e—includes grading; m—by municipality.

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CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

MARCH 23, 1916

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Political Boundaries vs. Natural Laws.

In our department of "The Week's News" last week, three items appeared consecutively (by chance) which served to illustrate that even the courts, which are accustomed to dealing with men and man-made laws and not with physical or engineering matters, are coming to realize that legal boundaries of territory are not recognized by natural laws, and must often be disregarded when dealing with such laws; and that it is often desirable for communities which are separate corporations to cooperate in some of their public improvements or services.

Of the articles referred to, one states that the courts have ordered Detroit to make the sewerage of an adjoining village practically part of its own system. The second announces that the New Jersey Senate has passed a bill providing for the cooperation of a number of communities in constructing an extensive reservoir system in the mountains in the northern part of the state for supplying them all with water. The third item refers to the metropolitan water system, of Massachusetts, which has for some years been serving a considerable number of cities and towns acting jointly.

The first of these is perhaps the most interesting, in that the court held that Detroit, which lay between the

village of Highland Park and the body of water which would naturally receive its drainage, was depriving that village of its riparian right if it refused to arrange with it for conducting its sewage across the city to such outlet.

It is the general practice of sewerage engineers, in designing a storm water or house sewage system, to take into account all the territory draining naturally to the area to be sewered; since the city may in time annex such territory and wish to sewer it, while as to surface water, that must be taken care of in any event, for it will insist on flowing down hill and disregarding legal boundaries. Any engineers who do not plan with these ideas in view are laying up trouble for their clients.

But lawyers and non-technical officials are apt to insist on disregarding such engineering advice, claiming perhaps that they are not legally empowered to spend additional money in providing for drainage from areas not at present included within the corporate limits of the city. It is therefore encouraging to note any steps taken by the courts toward a broader view of the question, and a recognition of the fact that, in a great many if not the majority of cases where large public services are in question, political boundaries should be disregarded in solving the purely physical and engineering problems. Among such problems are those of sewerage, drainage, stream pollution, water supply, street lighting and paving to a certain extent, and occasionally refuse disposal. An engineer is not doing his full duty, who, when employed to report upon or design any of the engineering features for a public utility, does not consider the problem as one of natural laws entirely unfettered by political boundaries or legal limitations, and report to his employer the solution so reached; leaving it to such employer to take the risk of opposing man-made laws to physical and economic ones.

Districting Cities.

Twenty-five years ago any one venturing to propose a law by which a property owner would be denied the right to use his property as he saw fit so long as he did not create a nuisance would be called un-American if no worse name. But ideas are changing rapidly. Boston has not only limited the height of buildings, but has fixed different height limits for different districts. New York is now going further, and is preparing to do what every student of the subject must see is the only truly economical and otherwise proper thing to do—divide the city into districts and restrict the use which may be made of the property in each district.

The city charter of New York conferred on the Board of Estimate and Apportionment power to district the city for the purpose of regulating the height of buildings, the area of courts and yards, the location of trades and industries and the location of buildings designed for specified uses. The Board appointed a Commission on Building Districts and Restrictions, and this committee on March 10th submitted a report of about 8,000 words in which it presents recommendations as to districting with reference to height and area of buildings and the use to be made of property, residential, business or industrial, in a given district.

The advantages of districting cities seem to be indisputable once the plan is inaugurated, the only individual sufferers being those which are already using their land in a way which is barred by the new restrictions. Real estate will almost invariably bring a higher price when the future development of the surrounding area is definitely fixed than when the owner of the adjoining property may use it for any purpose he sees fit or erect a building as high as he pleases. This applies not only to residences, but to business districts as well. So objec-

tionable to retail business houses is the presence of those devoted to manufacturing that many large retailers of New York have agreed to give preference, in purchasing their stock, to those manufacturers or makers who are located outside of a certain area fixed by the retailers as the retail business district of the city. Here we have private individuals endeavoring to effect by business pressure what the city could, and it is to be hoped soon will, do by law.

This report, if adopted in anything like its present form, will be the most important step ever made by a city of the United States towards securing its orderly and systematic development, to the extent of subordinating private desires and property uses to the general good.

REFUSE COLLECTION IN SANTA CRUZ.

In Santa Cruz, California, refuse is collected by private parties licensed by the city, but the rates which they charge are fixed by the city. Within the fire limits they are 35 cts., 50 cts., \$1 and \$1.50 per month for one, two, three and six collections per week, respectively; and outside the fire limits, 35 cts., 50 cts., 75 cts. and \$1.25 per month; payable in advance. If not paid in advance, the collectors may ask 10 cts. for each emptying of a ten-gallon can, and 15 cts. for larger cans.

The ordinance provides that:

No garbage shall be allowed to accumulate except in galvanized steel water-tight cans with close fitting covers and provided with durable handles and having a capacity of not less than five nor more than twenty gallons. The garbage cans and refuse receptacles must be placed in a position easily accessible to the regularly licensed garbage collectors. Wire or perforated corner sink drains must be provided as a simple and efficient means of allowing the free liquid in kitchen garbage to be drained to the sewer, where it properly belongs, after which the garbage must be wrapped in paper before being placed in the garbage cans.

The advantage of this is that it prevents the constant presence of flies in and about the garbage cans and renders more cleanly the collection of garbage and overcomes the nuisance of odor from passing garbage wagons.

The garbage and combustible refuse so collected are burned in an incinerator which is located at the city pumping plant. Refuse must be separated by the householders into garbage, combustible refuse, and non-combustible rubbish.

MUTUAL DEFENSE AGAINST SEPTIC TANK INFRINGEMENT SUITS.

Another organization for mutual defense against suits for infringing septic tank patents was formed March 14th at a meeting of the League of Iowa Municipalities, named the "National Septic Process Protective League." Quite recently a number of Iowa municipalities have been notified by the Cameron Septic Tank Co. that they are infringing that company's patents, and a meeting of the League of Iowa Municipalities was called to consider the matter, which was attended by 35 delegates from Iowa, Kansas, Minnesota and Ohio.

At this meeting R. E. Sampson, Ass't Attorney General of Iowa, stated that in his opinion the patent had expired, and the "Protective League" therefore decided to contest any infringement suits to the court of last resort, all the members contributing to the cost of such defense. The membership is open to municipalities, companies, state institutions and private individuals, subject to the approval of the executive committee.

Assessments were agreed upon ranging from a minimum of \$10 for municipalities of less than 2,000 population to \$35 for those of over 50,000. Dr. H. M. Bracken of Minneapolis, secretary of the Minnesota State Board of

Health, was elected president, Elliott Kimberly vice-president, and F. G. Pierce of Marshalltown, Iowa, secretary-treasurer. A board of directors was chosen, containing two from each of the states of Iowa, Kansas, Ohio, Illinois, California and Minnesota. These included the engineers of the State boards of health of Iowa, Kansas, Ohio, Illinois and California and a member of the Minnesota board.

The letters received by the cities concerning patent infringements class under these "tanks which employ putrefactive reduction of sewage solids, but which for purposes of evasion have been styled 'sedimentation' or 'settling tanks,' as well as to the more recently exploited 'Imhoff' or 'two-story' septic tank." The terms demanded for licenses under the patent were 3% per annum on the cost of the plant, including the tanks, contact beds, filters or other appurtenances, for the number of years each plant has been in operation to date of settlement, plus an additional 3% for the remaining unexpired term of the patent.

TO PREVENT STREET LITTERING.

March 11, 1916.

Editor of Municipal Journal, New York, N. Y.

Dear Sir—With all the talk about cutting down expenses in our cities it seems strange that no one has suggested saving millions by the very simple plan outlined below.

It is safe to say that had the automobile made its appearance as a machine which dropped and scattered organic filth to the amount of several pounds at frequent intervals it would have been forbidden the use of public thoroughfares. Yet we have that edifying spectacle with us at present in the horse. Can anything nastier be thought of than the unsightly manure strewn streets of the entire world! Why do we permit such dirty and filthy practices when the means of prevention are so simple? It is because we are used to them, and it is difficult to overcome inertia.

Many years ago it was suggested that each horse be provided with a receptacle attached to the harness to catch the droppings before they fell to the street. This excellent idea was promptly buried because it was not a nice topic for discussion. The time is ripe now to make some such scheme compulsory. Co-operation between the departments of Health and Street Cleaning could result in making and enforcing a law obliging all drivers of horses or mules to provide an approved receptacle to catch all manure. At frequent intervals, to be determined after trial, permanent stands should be erected where the contents of the receptacles on the horses can be emptied. The manure deposited at these stations will be free from foreign matter and may be sold by the city for a good figure, instead of being disposed of at a loss as at present.

The first effect of such a measure would be the reduction in street cleaning costs due to the fewer number of men and apparatus needed, and to the income from the sale of manure. The second effect would be the improved health of children and adults, whose lungs would not be filled with wind blown manure, and a decrease in the number of breeding places for flies. The third would be our improved sense of cleanliness and decency, and a greater pride in our spotless cities. There would be no hardship on the horses, and the expense to the owners would be practically nothing.

Of course we may expect a howl from teamsters' associations, from department stores, express companies, and from many others in the carting business, to say nothing of the wail from the politicians who represent the street sweepers and contractors. The carters will at first fail to realize that many of the accidents to their horses are due to slippery streets made so by manure. The tractive effort of adhesion is lowered because of the same condition; on a slippery street a horse cannot pull the same load he can when the coefficient of friction due to dry surfaces of street and shoe is greater.

Automobilists will welcome such a measure with open arms. It means less dust less mud, less skidding, and greater safety and pleasure.

I purpose pressing this matter and bringing it to the attention of those in authority in our large cities. If you can give it publicity in the Municipal Journal it will be the initial step in a campaign for cleanliness, health and safety.

Very truly yours,

JOHN S. CRANDELL

The WEEK'S NEWS

State Road Work in Oregon, Iowa and California—Health Work Efficiency in New York City—The Passaic Sewer—Measles in Many Cities—Sewer Explosions in Pittsburgh, Newark and Detroit—End of Philadelphia Rate Case—Free Municipal Lights in New Jersey—New York's Police Merit System—Fertilizers from Municipal Waste—Snow vs. Appropriations—Civic Exposition for Philadelphia—New York's Municipal Ferries.

ROADS AND PAVEMENTS

Uniform Records for Road Work.

Salem, Ore.—At a conference between state engineer Lewis and the principal field engineers of the highway commission, it was decided to issue a manual of instruction for survey work in locating and constructing highways, and to adopt a uniform cost-keeping system. Forms for standard contracts, vouchers and accounts were also decided upon. "Approximately \$6,000,000 is being expended annually in Oregon on roads, most of which is without adequate cost keeping or engineering records," said Lewis. "This does not include the \$240,000 expended by the state highway commission. Until comparative plans and until figures as to cost are conveniently available it will be impossible to enforce any economy or efficiency program. We must be able to compare the results accomplished in one county with those in another, or by the state."

Iowa's Road Funds.

Des Moines, Ia.—Iowa property owners will pay \$9,617,915 in direct taxes in 1916 for road and bridge work, according to the financial report prepared by W. H. Williams, in the auditor of state's office. To this will be added between \$1,500,000 and \$2,000,000, which will be received from motor registration, making more than \$11,000,000 available for bridge and road work during the year. In 1915 the taxpayers turned in \$8,870,121 for such construction. The increase in road and bridge taxes for 1916 is \$747,894. The report includes all levies for county and township roads. According to the figures submitted to the auditor of state, the per capita rate will be \$21.22 in taxes in 1916. The per capita tax in 1915 was \$20.89. The increase is greater than these figures indicate for the reason that the per capita tax in 1915 was based on the 1910 census, which gave the state 2,224,000 population. The 1916 per capita tax is based on the 1915 census which gives the state 2,358,000 population. The increase in taxes, to be paid this year, is \$3,579,925. The total in taxes which property owners will pay is \$50,055,131. In 1915 the total taxes collected for purposes in the state was \$46,475,206. Every form of tax was increased this year with the exception of the state and the drainage taxes. City taxes increased from \$7,209,074 to \$7,537,150. Moneys and credits increased from \$251,828,587 to \$275,361,750. The net value of all property listed for taxation, except moneys and credits, increased from \$932,476,812 to \$945,061,505.

A Convict-Built State Highway.

Springfield, Ill.—A state highway at the foot of the Mississippi River bluffs to run between East St. Louis, Ill., and Chester, perhaps to reach in time to Cairo, has been begun by convicts from the Southern Illinois penitentiary. The route is of scenic and historic interest. The southern section of the state has been slower than the northern counties to take advantage of the law permitting the employment of convicts in road building, but now a beginning has been made. In the last season fifty convicts were sent to Ava, Jackson county, and camped in tents on the shores of a lake, while they worked on a road from Ava to the Mississippi river. The section of the highway between Chester and East St. Louis now being built is between the prison and Fort Gage. The convicts working here have so far been housed in the prison. The road is one of the oldest

in the state. It was overgrown with trees and impassable during a large part of the year. In a report to Governor Dunne by the warden and commissioners of the Southern Illinois penitentiary, it is said the road to East St. Louis can be built from rock quarried from the bluffs nearby at small expense. Agitation has been begun to induce the counties through which the road must pass to bear their share of the expense. Not a man assigned to the road work from the Chester penitentiary attempted to escape last season, and the amount of work performed was very gratifying. The prisoners at Chester are chiefly employed in the limestone quarry, which is in the prison yard, the institution lying at the foot of a bluff on the shore of the Mississippi river. A brick yard is also operated at times. In 1915 crushed stone valued at \$14,190 was furnished free for road building, and \$13,356.40 worth of ground limestone for agricultural use was sold at 60 cents a ton loaded in the prison yard. Cut stone valued at \$15,057.20 was sold.

California Highway Costs.

Sacramento, Cal.—The state highway commission has already expended \$14,351,332 of the \$18,000,000 highway bond issue voted several years ago, according to figures given out by State Highway Engineer A. B. Fletcher. Of this amount \$11,591,188 has gone into actual construction, \$604,926 into what is technically termed overhead and the remainder into expense for inspection, surveys and other such work. The commission has on hand \$3,647,678, but of this amount only about \$1,500,000 is available for new construction, the remainder being payable on contracts under way.

New Kansas City Traffic Way.

Kansas City, Mo.—The Wyandotte county commissioners have awarded the contract for the construction of the Central Avenue traffic way, which will give another short-cut between the two municipalities that form Kansas City. The structure will cost \$600,495.27. The building of the Kaw River bridge which will replace the present Central Avenue Bridge, and of constructing the approaches, one of which will carry traffic over the railroad yards to James Street, was awarded to the Missouri Valley Bridge and Ironworks for \$392,661.27 and that of building the concrete work to the Midwest Construction Company for \$207,674. Six years ago the agitation for a traffic way at this point began. The final plans were drawn by L. R. Ash. The Kaw River Bridge is to be on two levels. The street railway company will pay a portion of the cost.

Plans for Traffic Survey.

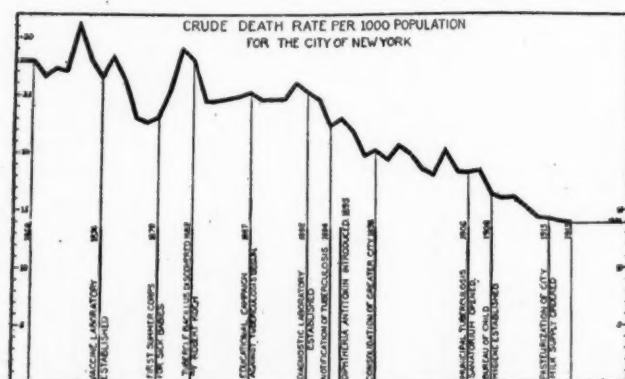
St. Louis, Mo.—The St. Louis county court has announced that arrangements have been made to employ fifty engineers to take a traffic census of all roads of St. Louis county to determine the character of the roads needed in each locality, and W. E. Resengarten, federal highway engineer, has arrived in Clayton to take charge of the work. Altogether 25 points have been chosen for observation. The fifty men under Resengarten will work in twelve-hour shifts. No roads are to be built out of the bond issues until they have completed their survey, which will take twenty-eight days spread over four periods of a week each. The first census will be made this spring. Others will be made in the summer, fall and winter. Half of the men will be on the roads by day and half by night. They will stop all

persons passing the observation points, estimate the weight of their vehicle, the amount of load carried and number of persons on board. Care will be taken to prevent persons from passing by a point so as to make it appear the road is in greatest need of improvement. By placing the men at intersections they can observe traffic on two roads at the same time.

SEWERAGE AND SANITATION

The Falling Death Rate of New York.

New York, N. Y.—In connection with the semi-centennial of the establishment of the department of health, one of the department's recent bulletins published the accompanying chart showing the reduction in the death rate, together with certain significant occurrences in health matters. Interpreting the chart, the department says: "As one studies the work of the Department of Health during the past century, it is possible to discern several different periods—quite apart from those pertaining to organization. The first period may be termed the Period of General Sanitation (up to 1860). During this time the attention of the authorities is fixed on the larger sanitary problems, such as water supply, sewage disposal, street cleaning, housing conditions, etc. This is followed by a Period of Quarantine Enforcement (1860-1880), during which time efforts are made to control infectious diseases, chiefly by means of strict quarantine regulations; supplemented in many instances by disinfection. The discoveries in bacteriology in the seventies, eighties and nineties usher in a Period of Applied Bacteriology (1880-1900), during which time real preventive work, based on the newer conceptions of medicine,



HEALTH WORK AND DEATH RATE.

was carried on. Within the past twenty years, initiated largely by the intensive campaign against tuberculosis, the social aspects of disease have become increasingly prominent, and one may therefore speak of a Period of Social Analysis of Disease (1900-). This field still requires extensive cultivation and holds out promise of rich reward. More recently there appears to be developing a period in which Personal Hygiene and Education (1910-), is to play a leading part. Altogether, the tendency is away from administrative control, in favor of individual effort and co-operation. If our achievements in the future are even measurably as effective as those of our predecessors, we should ere long make New York one of the most salubrious cities in the world."

Delay in Passaic Sewer Completion.

Newark, N. J.—The Passaic Valley trunk sewer will not be completed in time to comply with the law that requires that the pollution of the Passaic River shall cease by January 1, 1917. The situation has been realized by the Passaic Valley Sewerage Commission, which has the construction of the great flume in charge. The greater part of the work, it is expected, will be done by the middle of the summer of 1917, but probably it cannot be entirely cleaned up before the end of the year. The commission has already asked the legislature for continuation for one year. No settlement has been made, commissioners announced, of the claim of the O'Rourke Engineering Construction Com-

pany of New York, which asks for more money to continue its tunnel contract under New York Bay. The work in Section 2, as this three-mile portion of the big sewer is known, has been about one-third completed. There remains a stretch of 10,000 feet. This, the company states, it will not continue to work on unless the commission makes added payment, aggregating probably \$200,000. The contract was let February, 1914, for \$1,796,900, which was about \$300,000 less than the next nearest figure. Mr. O'Rourke's claims, which are urgently made, are being considered by chief engineer William N. Brown and Adrian Riker, counsel for the commission. It is regarded as unlikely that a satisfactory agreement can be reached. The original contract with the O'Rourke company called for free air work. The company, however, states it has found much loose mud and sand, which makes necessary the use of high pressure air. This is more expensive, it is claimed, and is slower and more wearing on workmen. The work in Section 2 is the most important of the whole project. Though the commission says there will be money enough to finish the work, it admits costs are exceeding expectations. Specifications were drawn up several years ago, and labor, materials and practically all other items have advanced since then. Labor cost is at present bothering the contractors and men are getting scarcer each day. The board is inclined to lay the blame for this time extension on delinquent towns. President Bernard W. Terlinde explains that the commission has followed the practice of not letting contracts until money was in hand to push them through. This has resulted, Mr. Terlinde states, in delays approximating two years, all because Passaic Valley communities have not paid their assessments promptly.

Measles.

Newark, N. J.—Nearly two-thirds of all cases of communicable diseases reported to the health department during February were measles, according to the monthly report of health officer Charles V. Craster. There were 1,331 cases of the disease, which is now epidemic in the city. The total of all forms of communicable diseases reported was 2,124. During January there were 783 cases of measles reported, indicating how rapidly the epidemic has grown. In February of last year, when disease conditions were normal, there were twenty-eight cases of the ailment during the entire month.

Allentown, Pa.—There have been three deaths in connection with the epidemic of measles in Allentown, and in face of the fact that the schools are closed and the town quarantined by order of Dr. Dixon, the state health commissioner, there is little sign of its abatement. There were upwards of 500 cases reported in six weeks, although the number of new cases appears to be decreasing.

Kutztown, Pa.—The local board of health has closed all the public schools, theaters and five churches until the epidemic of measles is under control. There are seventy cases.

Northumberland, Pa.—Because of more than 100 cases of measles existing in Point township, Northumberland county, nearby public schools have been closed. They will be reopened after thorough fumigation.

Cleveland, O.—A severe epidemic of measles among school children is rapidly developing on the east side, according to Dr. E. A. Petersen, city school health director. One hundred and eight cases developed in three days, according to the school reports, and in two weeks 306 cases were reported.

Rat Extermination in Tacoma.

Tacoma, Wash.—The campaign against rats has begun in Tacoma under the supervision of H. W. Tinker, sent here by the federal government. The city has been divided into districts. Places for 200 wire snap traps have been selected and traps set. By trapping in districts the campaigners will know how well they are covering the territory, and when one district is cleaned up another will be established, according to the scheme of William B. Pryor, federal sanitary inspector. Mr. Tinker will be in Tacoma

a year, with headquarters at the city hall. The city furnishes the traps and bait, and Mr. Tinker's salary is paid by the government.

Sewer Explosions.

Pittsburgh, Pa.—The accompanying illustration shows the effect of a recent gas explosion in a sewer. City engineers are investigating this explosion which damaged a number of houses, tore up the street for nearly a block and injured several persons.

Newark, N. J.—Telephone and electric conduits and sewers filled with gas and ignited, under pressure because of snow-covered manholes, caused a number of explosions which swept four blocks. Manhole covers were blown up and a number of houses were damaged.

Detroit, Mich.—About 10,000 gallons of gasoline leaking from a tank car into a sewer caused a terrific explosion which ripped up two miles of brick and concrete paving, blowing fragments hundreds of feet. Investigation by city boiler inspector McCabe disclosed the fact that a small bolt in the nozzle through which the tank was emptied prevented the cap from closing the nozzle. City engineer McCormick estimates that the sewer and pavement repairs will cost about \$100,000 and the damage to private property will raise that figure much higher. Corporation counsel Dingeman expects to start suit against the shipper of the defective tank.

WATER SUPPLY

Profitable Waterworks.

Duluth, Minn.—Gas and water are cheaper now than they ever were in the city's history, according to the annual report by Manager Reid, of the water and light department. The financial statements show a net profit of \$95,981 in the operation of the gas and water departments during 1915. One feature of the year was the reduction in water pumped, while more water was used by the consumers, this being explained by the fact that leakages have been stopped, making a saving to the city of nearly \$3,000 for the year in pumping expenses. Since 1898, the comparative statistics show, the cost of gas has been reduced from \$1.90 per 1,000 cubic feet for lighting and \$1 for fuel to 75 cents each. All over 50,000 feet is charged but 50 cents per 1,000. In 1904 consumers were charged 17½ cents per 100 cubic feet of water for the first 1,000 feet, while the present rate is 15 cents per 100 cubic feet for the first 10,000 feet used, 12 cents for the next 10,000 feet, and 8 cents per 100 feet for all over 20,000 used. The city now has 8,546 and 10,129 gas meters in service, while there are 156.12 miles of water and 140.57 miles of gas mains, according to the report.

Topeka, Kan.—The annual report of the city waterworks, prepared by F. L. Stevens, shows that the plant did a business of \$125,149.18 during the past year and after paying all operating expenses, making all repairs, paying interest and spending nearly \$1,000 on new pipe lines, it placed \$37,833.55 in the sinking fund, leaving a balance of \$5,816.32. At the beginning of last year the cash on hand amounted to \$178.75. Of the total revenue \$98,588.26 came from the water meter rates and \$15,381.36 from hydrant rentals. The remainder came in the form of interest on bonds held by the department and from miscellaneous sources. The total expenditures incident to the operation of the plant amounted to \$74,185.12. The salary account is \$8,227.50, while the wages amounted to \$10,964.73. Other expenditures were: Fuel, \$6,645.55; supplies, \$2,214.86; insurance, \$71.25; merchandise, \$4,732.25; construction, \$10,728.67; repairs, \$2,862.77; other expenses, \$7,737.54. The law requires that 2 per cent of the bonded indebtedness be set aside each year and in the present instance that amounts to \$12,400. Ten thousand dollars of the money in the general fund was transferred to the interest fund. The balance in the fund the last day of the year was \$32,888.41. In the interest fund account, \$27,290.15 was paid out as interest on the department's bonded indebtedness.

There was a balance of \$227.74 left in the fund. The sinking fund received \$4,565.32 to interest accounts—money paid by outsiders on bonds owned by the water department. The sinking fund also received \$13,038.73 on bonds matured, then received \$37,833.55 from the general revenue fund. The department purchased \$55,500 worth of bonds during the year. The bonds bear 4½ and 5 per cent interest. Of the bonds owned by the department \$13,038.73 expired during the year and the department still owns bonds to the value of \$143,249.57. The total bonded indebtedness of the waterworks is \$620,000. Of this amount \$270,000 worth of bonds fall due in 1925. The yearly addition to the sinking fund will take care of those bonds when they fall due. The remainder of the bonds will be due the same year, but they will be refunded.

City Takes Over Water Plant.

Menominee, Mich.—The city of Menominee has taken over the plant of the Menominee Water Company, thus ending one of the bitterest fights ever waged in the city council. The purchase price was \$200,000. Mayor M. B. Lloyd will name the waterworks board, and plans will be laid for the erection of a filtration plant which will cost approximately \$85,000.

STREET LIGHTING AND POWER

Philadelphia Company Capitulates.

Philadelphia, Pa.—The protracted hearings in the case of Morris L. Cooke against the Philadelphia Electric Company had a dramatic ending when the company announced a sweeping reduction in rates amounting to about 20 per cent to begin April 1. To the company this will mean a cut of about \$1,250,000 this year from the \$7,849,000 earnings in 1915. To the small consumers the reduction will approximate a total of \$800,000 and to the city about \$100,-



Courtesy, Pittsburgh (Pa.) Industrial Development Commission.
EFFECT OF A SEWER EXPLOSION.

000. As the rates of the Philadelphia Rapid Transit and the Pennsylvania Railroad will not be cut, the reduction will mean more to the 60,000 smaller consumers. Part of the arrangement is that the city is to get back \$150,000 paid by it for street lighting last year and about \$275,000 paid this year. Commissioner Monaghan will recommend that the arrangement be accepted. Mayor Smith has stated that council will be asked to reimburse Mr. Cooke, who personally financed the case. Numerous changes in the methods of accounting and record keeping employed in the various public utility corporations of this state will be directed by the public service commission, it was reported, as a result of the settlement of the rate case. Introduction of a uniform accounting system which will plainly show the cost of the plants, operating expenses, cost of maintenance, profits, reproduction cost and other financial phases of the company's condition, it was stated, will follow within the short period of time necessary for the service commission to complete arrangements. For some time accountants of the commission have been investigating the various methods of bookkeeping and accounting in use in the large corporations of Pennsylvania. Copies of all possible systems have been obtained, with a view to arriving at some uniform method. The experience of the commission in the Philadelphia Electric Company's case, when experts differed widely on valuations, inventories, reproduction costs and other essentials, will serve as a guide in the handling of the new system.

Cities Cannot Fix Gas Prices.

Topeka, Kan.—The distributing companies in Kansas cities which purchase gas from the Kansas Natural Gas Company cannot increase the rates beyond that fixed by the public utilities commission, even though a city may have granted a franchise permitting a higher rate. The rule applies also to the distributing companies which may have their own gas wells to furnish part of the gas sold. This was the ruling of the Kansas supreme court in the suit brought by the state against the Olathe Gas Company and the receivers for the Kansas Natural. The Olathe Gas Company had been granted a franchise which permitted it to charge thirty cents a thousand cubic feet. The public utilities commission held that twenty-eight cents was the highest price to be charged for Kansas Natural Gas Company gas. The Olathe company attempted to increase its rate to thirty cents. The Johnson county district court and the supreme court held that this would not be permitted.

Free Light for City Legal.

Trenton, N. J.—Municipalities of the state won a distinct victory by a unanimous decision of the Court of Errors and Appeals, holding that the contract by which the Public Service Electric Company agreed to furnish free lighting to the municipal buildings of Plainfield is valid and enforceable. The essence of the opinion written by Chancellor Walker is that the language of the public utilities act is prospective and not retroactive, and does not apply to the contract made with Plainfield in 1898, then lawful. The effect of the decision is to sustain other contracts made between municipalities and public utility corporations prior to the enactment of the public utilities law. This would presumably include, for instance, the five per cent tax on trolley receipts in Newark, which, it was contended, would fall if the Supreme Court's decision in the Plainfield case were sustained upon the ground taken by that tribunal. Although the Court of Errors and Appeals affirmed the Supreme Court decision upon other grounds the opinion by the chancellor indicates a reversal in so far as the more important questions involved are concerned. The Court of Errors held that the Public Utility Commission, in effect ordered the specific performance of a contract, which is an equitable power exclusively residing in the Court of Chancery. Hence, while sustaining the validity of the contract, the court held the city had not sought the proper tribunal to maintain its rights.

The contract of 1898, which included the provision for free lighting, was part of the consideration under which Plainfield granted a franchise to the Public

Service Electric Company. After carrying out the terms of the Contract for more than fifteen years, the Public Service Company discontinued the free service upon the ground that it was prohibited from granting gratuities under the public utilities law. This was followed by an appeal to the Public Utility Commission, which ordered the company to resume the free service. On appeal the Supreme Court held that the provision for free service was voided by the public utilities act and that the language of the act was not broad enough to confer power to enforce specific performance of contract. The Court of Errors agreed with the latter contention, but not with the former. Plainfield was joined in the litigation by the Public Utility Commission and by a number of municipalities which were indirectly affected by the decision, including Newark, Jersey City and Passaic. Later the New Jersey State League of Municipalities joined in the appeal on the ground that the issues involved were widespread and would affect every municipality where permission to operate a public utility had been granted. It was contended, for instance, that many contract agreements and contract ordinances existed between public utility companies and municipalities in all parts of the state, and that if the Supreme Court decision should be upheld, then every special advantage received by the municipalities in return for granting privileges to the utilities would be voided. In Newark, it was claimed, the trolley company would no longer be compelled to give transfers, to keep the fare within the city limits at five cents, to carry policemen and firemen free, to give a three-cent fare to school children, or to run a direct line from South Orange. The argument was also put up that the sustaining of the Supreme Court in the case would mean taking away from the municipalities of rights to impose a tax on utility property because of tax exemption by charter; to compel trolley companies to pave between their tracks and keep the pavement in repair; to regulate the headway of cars; to require an annual license fee for cars, and to insist on the extension of service to terms that had been promised by the company.

To Decide Between Franchise and Utility Commission.

Billings, Mont.—The city of Billings has commenced action in the district court to determine by a friendly suit if the rates of the local company are to be decided by the state public utilities commission or by the provisions of the company's franchise. City Attorney Taylor has filed a petition and an affidavit for a writ to compel the gas company to reduce the rate of gas from \$1.80 to \$1.50 per 1,000 cubic feet. The petition is based on a section in the franchise under which the gas company is operating, stating that whenever the output of the gas company exceeds 30,000,000 cubic feet in any one year, the maximum rate shall be reduced to \$1.50 per 1,000 cubic feet with an additional reduction of 10 cents to such consumers as pay their bills by the 10th of the month following the month in which the gas is used. Owing to the fact that the state public utilities service commission has authorized the present maximum rate of \$1.80 per 1,000 cubic feet, the output for 1915, according to City Attorney Taylor, was 38,316,050 cubic feet.

Would Abolish Sliding Scale System.

Boston, Mass.—Members of the Gas and Electric Light Commission recommend the abolition of the sliding scale system of regulating gas prices as applied to the Boston Consolidated Gas Company unless the ownership or control of the stock of the company is taken out of the hands of the trustees of the Massachusetts Gas Companies Association. The board also opposes the extension of the sliding scale system to the other gas companies in Massachusetts. The board says: "This system of regulation for the Boston company was deliberately adopted ten years ago after an elaborate investigation and with the earnest support of a number of individuals, who disinterestedly believed it to be in the public interests. Upon certain features of this problem opinions may differ. But one thing is clear that the trading relations with the affiliated companies of the Massachusetts Gas Association, forced upon the Boston

company by their common ownership, are inconsistent with the purpose and theory of the 'sliding scale' as a scheme of regulation. If profits can reach the stockholders of a gas company under the 'sliding scale' by any other means than through its dividends, the basis of control is impaired, if not wholly destroyed. It is immaterial to the owners of the securities whether the dividends which reach them come from the profits of the gas company, or the gas and coke company. But it is of vital importance to the consumer that, if his sole reliance for lower prices rests upon the incentive of the 'sliding scale' no profits on the gas which he consumes shall be distributed save through the dividends of the gas company. Moreover, with a holding 'association' superimposed between the gas company and the investors, the essential feature of the 'sliding scale' system of regulation, namely, the sale of additional stock at auction, has been and probably will be always inoperative. In the light of the experience of these ten years, there is no promise of any further reductions in price under it so long as the present relations with other companies affiliated under the 'Association' are maintained. Furthermore, the evils commonly attendant upon the control of public service corporations by holding associations are by no means diminished by the 'sliding scale' and are destructive of any sound system of regulation which safeguards the resources of the corporation under supervision in the interests of consumers and investors alike. Otherwise they may at last through dissipation of their resources become so enfeebled as to forbid any hope of adequate service at low prices."

FIRE AND POLICE

Costs of Police Protection.

Minneapolis, Minn.—Minneapolis spends less money for police protection than any but two of 21 cities of over 200,000 population in the United States, according to announcement made by city statistician H. A. Stuart. Of the cities which have 200,000 population or over 21 replied. Minneapolis stands only five from the bottom of the list of 23 cities of 200,000 or over in the amount of money they spend for their fire departments. Minneapolis spends only \$1.22 per capita on her police force; Boston, the leading city in the list, invests \$3.68; Santa Fe, \$3.42, and New York, \$3.22. New Orleans stands at the foot of the police line, with an expenditure of \$1.11. Denver is the only other city spending less than Minneapolis. Denver spends \$1.16. For protection against fire Boston spends \$2.09, while Minneapolis spends but \$1.60.

Merit System for New York Police.

New York, N. Y.—Police commissioner Woods has begun in earnest to try out the new "merit system," by which the heads of the police department may see at a glance just what the record is of every uniformed man and of all the detective sergeants. The purpose of the plan is to give the men an added incentive to do good work and to keep their records so free from fault that in case they come up for promotion their records will aid them. The new system is to be worked out with cards which are to be kept in the various police stations and the sergeants are to write on each man's card certain marks due him for good work and certain demerit marks charged against him for any fault in his work as a policeman or for misbehavior. The system was first tried out in two precincts, and it appeared to work satisfactorily. Now the system is to be extended, but whether it will run all over the city has not yet been decided upon. Among the things which will result in demerits are untidiness in habits, slovenliness in dress, discourtesy to citizens, for improperly treating and searching a prisoner, for sitting in a public conveyance when citizens are compelled to stand for lack of seats, for reading on patrol, for being late at roll call, and for smoking when on duty. For good conduct, and for acts worthy of special mention, the merit marks run as high as 60. An honorable mention accompanied with a department medal yields the maximum number, while the winning of a department medal alone yields 40 merit marks, plain honorable mention 30, commendation 20, and excellent police duty 10. Merit marks may

also be earned for making arrests for arson, burglary and poisoning and for identifying persons for whom alarms have been sent out. Guy H. Scull, secretary of the department, says that the system is mainly one of figures and tables.

Tobacco Factory Fire.

Louisville, Ky.—A three-alarm fire originating in a tobacco factory spread to surrounding factories and residences until it did a total damage of about \$110,000. About a hundred men working in the factory rushed out in a panic. Nine engines and three hook and ladder companies worked on the fire and rescued a number of families.

Chemical Plant Explosions.

Niagara Falls, N. Y.—A series of explosions which racked buildings all over the city, causing great excitement, killed one man and injured six and destroyed a large part of the plant of the Niagara Electro-Chemical Company. The firemen were practically helpless, the use of water causing minor explosions when mixed with the chemicals. The buildings involved contained quantities of sodium peroxide. Twelve explosions followed the first. The big building was blown to pieces and the fire was very spectacular. The loss is estimated at about \$100,000.

Big Theater Fire.

Pottsville, Pa.—The Centennial Hall, one of the historical buildings of the city, was destroyed in a \$122,500 fire which damaged numerous business places and homes. The fire began in a store. Sparks were blown over the eastern section of the city, some being carried over a mile. The roof of the car shops of the Philadelphia and Reading Coal and Iron Company caught fire, but firemen succeeded in extinguishing the flames. The origin of the fire is not known and it is probable that it will be investigated by the state fire marshal. Several fires in this section have caused suspicion that a fire-bug is operating here.

New Signal System.

Schenectady, N. Y.—An improved system of electrically operated signals is to be installed throughout the city for the use of the bureau of police, to replace the old light system, discontinued last year at the time the fire alarm exchange was moved to its new quarters. One half of the system is to be constructed this year and the rest will be completed next year. The work will be in charge of the city electrician and his assistants. The new system calls for the installation of a red light on the pole at every fire alarm box in the city. The light is in use continuously nights to designate the location of the boxes. When the sergeant at headquarters desires to get in touch with patrolmen the red lights will flash off and on until the signal has been answered. Blue lights will be installed on all police call boxes. These will be illuminated only when the patrolman on the beat is sought at headquarters.

GOVERNMENT AND FINANCE

Council Has Salary Fixing Power.

Detroit, Mich.—The common council of the city has the right to fix the salaries of city officers, their assistants and clerks, under the charter amendment passed in 1914, without reference to the board of estimates, with a few exceptions. This is in substance the conclusion drawn from a lengthy opinion rendered by the supreme court in the case of Clarence M. Burton against Controller Engel and the city of Detroit. Mr. Burton attacked the validity of certain increases of salaries made last spring by the common council, on the ground that the board of estimates had the sole power to fix salaries. With the exception of the board of health and the board of education, the court holds really that the board of estimates has no power, as far as the salary question is concerned. As to the balance of the city officials, and all their subordinates, the sole power rests with the council, provided they keep within the limitations provided for in the charter amendment and do not run athwart the section

of the state constitution which provides that no officer either elected or appointive shall have his salary increased or decreased during the term for which he was elected or appointed. Twenty-five ordinances, passed by the common council after the charter amendment of 1914, were in dispute in the case. These fixed the compensation for all of the clerks and officials in almost every department of the city government and with one or two exceptions the supreme court holds the ordinances are legal.

Police Collect Unpaid Taxes.

Lockport, N. Y.—The city police have been made tax collectors. Owing to the large amount of unpaid taxes and the short time left in which to collect them, Mayor Earl has started policemen at work reminding citizens of their contributions to municipal government. Under the city charter the delinquent taxes may be collected by the city marshal, city constable or the police. The two officials have not the time to devote to this work, and the aid of the police has therefore been called. Mayor Earl has advised those who are delinquent, including some of the wealthy residents, to come to the treasurer's office unless they want a uniformed man at their doors.

Court Dismisses Somers System Objections.

Johnstown, Pa.—Judge Stephens, in court at Ebensburg, has overruled exceptions filed to the action of the court in dismissing the preliminary injunction restraining the city of Johnstown from entering into a contract with the Manufacturers' Appraisal Company of Cleveland for determination of property values within the first four wards of Johnstown by the scientific method known as the Somers Unit System, for purposes of assessment. The court also dismissed a petition of the plaintiffs for permission to introduce additional testimony with a view to showing that the Manufacturers' Appraisal Company had not fully performed the service agreed upon. The plaintiffs were granted a preliminary injunction last summer, but this was dismissed following hearings in which voluminous testimony was taken. Exceptions were filed. With the dismissal of the entire action, the only step now open to the plaintiffs is an appeal to the supreme court.

STREET CLEANING AND REFUSE DISPOSAL

Fertilizers from Municipal Waste.

Washington, D. C.—A survey by the United States Department of Agriculture of the nation's resources in fertilizer materials has drawn attention to the large supply of these to be found in the accumulation of garbage in cities. This waste material contains nitrogen, phosphoric acid, and potash, which are recognized as essential to the production of large crops. Valuable as these elements are to the farms of the country, the garbage in which they are found is a source of trouble and expense to the cities. It seems, therefore, that this garbage can be disposed of most advantageously by returning it to the soil in the form of fertilizer. In cities of 100,000 people or more the reduction of garbage by methods which furnish a residue fit for fertilizer use has proved to be a profitable municipal enterprise, and in smaller communities it might well be self-sustaining. Numerous analyses of raw garbage show that, on the average, grease constitutes 3.5 per cent; and of the fertilizer ingredients potash, 0.3 per cent; bone phosphate, 1 per cent; and nitrogen in the form of ammonia, 1 per cent. On this basis the value of a ton of raw garbage is about \$5, the grease being worth \$3 and the fertilizer ingredients about \$2. Since the grease is of more value than the fertilizer, the reduction process is primarily designed to recover the grease. There are three principal methods of doing this. The garbage is cooked and steamed and then pressed dry and degreased in gasoline. Or, the garbage is dried directly in rotary hot air kilns and then degreased in gasoline; or it is dried and degreased in one operation. As raw garbage contains 70 per cent water and 3.5 per cent grease, the

yield of the tankage residue or fertilizer should be about 25 per cent. Thus, 4 tons of raw garbage should be made to yield 1 ton of dried tankage and \$12 worth of grease. In the retail market the dried tankage sells for about \$10 a ton and at wholesale for \$7.50. There has been no great fluctuation in these prices for some time. In actual practice, however, the percentage of tankage obtained is not usually 25 per cent. At present, however only six cities in the United States operate their own reduction plants, and about 20 send their garbage to privately owned plants. These produce in the course of a year 160,000 tons of tankage, or fertilizer, made from 1,045,000 tons of raw garbage. If all of the 199 cities in the United States which have a population of 30,000 or over should adopt this method of garbage disposal, the total yield should be from 637,500 tons to 937,500 tons of fertilizer per year. This would be worth from \$4,780,000 to \$7,000,000. Additional fertilizer material could also be obtained in the cities from dead animals, street sweepings, and stable manure.

More Snow Figures.

Waterbury, Conn.—The cost of snow removal is making big inroads into the street department's labor account, and Street Commissioner William E. Kennedy figures that the 37 storms during the winter months have cost the city \$10,382.03. Of this sum \$6,023.50 was spent up to January 1 and the remainder since. The department is worried by the fact that it has no appropriation for snow removal this year. About 150 men have been at work at a time.

Boston, Mass.—Between the first of the year and the end of the first week of the month the city spent over \$75,000 on snow removal, and of this sum \$23,000 was paid to contractors. Commissioner Edward F. Murphy, of the public works department, is having great difficulty in enforcing the law which requires that the Boston Elevated Company remove the snow not only from its tracks but also from both sides of them. There is no penalty provided for failure to comply.

Binghamton, N. Y.—Commissioner of Public Works John A. Giles declares that the recent cumulative snowfalls is making holes in the street cleaning funds. In twelve days recently \$800 was spent. However, sudden thaws threaten flood conditions with which the department would be unable to cope.

Naugatuck, Conn.—The cost of snow removal this year in the borough will be greater than in any previous year. This is causing the municipality's expenditures this year to beat all previous budgets. The cost of snow cleaning so far has been nearly \$3,000 and only \$500 was allowed.

MISCELLANEOUS

Philadelphia Civic Exposition

Philadelphia, Pa.—Plans have been announced for what is declared will be the largest and most comprehensive civic exposition ever organized in the United States to be held in Philadelphia, at the Commercial Museum buildings, from May 10 to June 15. It will be known as the "Philadelphia Today and Tomorrow" Exposition; and it will have for its purpose the exhibition of what Philadelphia has done for herself in the past, and what she is to accomplish in the future. The exposition, which has the sanction of the mayor and city officials, will touch every department of municipal activity. Each of the city's great enterprises of city planning, streets and boulevards, parks, docks and harbors, transportation, public buildings, housing, health, sanitation, lighting, communication, protection and safety and commercial development is to be shown in comparison with those of Philadelphia's greatest rival cities. Not only the visible city, but its educational and social activities and its economic and commercial resources as well are to be given expression. The project was put before Mayor Smith by a committee including among others, George W. Norris, former Director of Wharves, Docks and Ferries; Howard B. French, president of the Chamber of Commerce; Dr. W. P. Wilson, of the Philadelphia Commercial Museum, and Mrs. Edward E.

Biddle, president of the Civic Club. The exposition will be under the immediate direction of Albert R. Rogers, who had charge of the Boston Exhibition. The Auditorium Hall of the Commercial Museum, which has 100,000 square feet of floor space, will be given up entirely to the exposition. The committee in charge is itself to finance the enterprise, although it is expected that the exposition, by means of a slight admission charge, may in the end pay for itself. There is to be no charge for exhibit space, but each organization exhibiting is expected to pay for the cost of preparing and installing its own exhibit and a fee of \$25 toward executive expenses. To secure space at all, exhibits must be of excellent merit. Lectures by and conference between experts from every part of the United States are to be a feature of the exposition during the month it is proposed to keep it open.

Store-Closing Law Invalid.

Astoria, Ore.—Pronouncing the classification of an ordinance, passed by the city of Astoria, requiring certain mercantile establishments to close at 6 o'clock in the evening on week days, to be arbitrary and unfair, the supreme court has reversed the action of circuit judge Eakin, of Clatsop county, in dismissing the suit to restrain the enforcement of the ordinance. The opinion was written by Justice Burnett in the case of Chan Sing et al., appellants, vs. the city of Astoria. In addition to sustaining the demurrer to the complaint, Judge Eakin struck from the complaint the quotation from the charter authorizing the passage of the ordinance, and reference to the stores excluded from its operation. The court held that he erred in both instances. Justice Burnett said in part: "It is the constitutional right common to all citizens, and no law shall be passed granting any citizen or class of citizens privileges or immunities, which upon the same terms shall not equally belong to all citizens. In our judgment the classification embraced in the ordinance is arbitrary and unfair, and no substantial distinction exists between those mentioned and those omitted." The ordinance covered the stores dealing in general merchandise, groceries, clothing, boots, shoes, drugs, drygoods, jewelry, meats and hardware, but did not apply to drug and cigar stores, millinery, fruit, confectionery, furniture and book dealers.

Municipal Ferries Show Gross Profit.

New York, N. Y.—For the first time since New York city began operating its own ferries the department of docks and ferries has announced a period of twelve months in which the revenues from the service exceeded the expenditures. Commissioner R. A. C. Smith submitted a review of the municipal ferries for ten years, from 1905 to 1915, to Mayor Mitchel, in which Mr. Smith stated that during 1915 an operating surplus of \$135,334 had been recorded by the boats running between Manhattan and St. George, S. I., and between Manhattan and Brooklyn. He added that this total was reached in the face of a net decrease in gross earnings of approximately \$23,000. Mr. Smith added, however, that in the figures no account had been taken of interest on investment or depreciation of property, which would be charged against earnings by a private enterprise. If these items had been taken into consideration and a fair annual sum charged against them the annual deficit for 1914 would have approximated \$747,500, and for 1915 would have approximated \$480,000. The commissioner reported that in 1915 the Staten Island ferry carried 14,896,036 passengers, and the Brooklyn service 1,656,050. The gross receipts of the St. George ferry in 1915 were \$846,615.18, as against \$854,866.54 in 1914, showing a net decrease of \$8,251.36. The operating expenses for 1915 were \$693,893.38, as against \$839,262.77 in 1914, or a net decrease of \$145,369.39, or 17.4 per cent. For the Brooklyn ferry, the gross earnings for 1915 were \$207,513.61, as against \$222,200.92 in 1914, the net decrease being \$14,687.31, or 6.6 per cent. The operating expenses were \$224,900.79 in 1915, as against \$369,938.11 in 1914, or a net decrease of \$145,037.32, or 39 per cent. The commissioner explained that during his administration three important measures of economy had been put into effect. The first was a reduction in the money spent for fuel for the

LEGAL NEWS

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Obstructions in Street—Nuisances—Removal.

Murden v. Commissioners of Town of Lewes, Inc.—Avenues, streets, and highways are generally designed for and devoted to the public use for travel and transportation, and the whole public have the right to their use in their entirety, and any unlawful tangible obstruction which interferes with its use for the purposes of public travel and transportation is a public nuisance.—Supreme Court of Delaware, Lewes, 96 A. R., 506.

Corporate Existence—Right to Question.

Barnes v. City of Kirksville.—In a suit against a city for salary due a marshal, where none of the objections to Laws 1913, p. 517, under which the city claimed to have removed him, involved a disincorporation of defendant municipality or its right to exist as a city of the third class, the Supreme Court was not precluded from considering such objections by the rule that the corporate existence of a municipal corporation can only be attacked by the state, through its proper officers.—Supreme Court of Missouri, 180 S. W. R., 545.

Commission Form of Government—Abolishment of Old Governing Body.

Devlin et al v. Wilson.—Where a city having adopted the commission form of government provided by Act April 25, 1911, held an election provided for an Act April 7, 1914, it must be presumed that after election the commissioners promptly organized, and therefore the existing municipal government immediately came to an end under the first statute, providing that, upon organization of the commissioners, the city council or other governing body shall ipso facto be abolished.—Court of Errors and Appeals of New Jersey, 96 A. R., 42.

Street Improvements—Arterial Highway—Assessments—Validity.

Moore et al. v. City of Spokane.—Where, in assessing the cost of a street improvement on part of an arterial highway, the city council laid the entire burden on the abutting owners within the termini of the improvement as authorized by Laws 1911, p. 446, §13 (Local Improvement Code), and the council did not proceed on the assumption that the streets improved were not part of an arterial highway, and the benefits equal the assessments, the assessments were not invalid as proceeding upon a fundamentally wrong basis.—Supreme Court of Washington, 152 P. R., 999.

Public Utilities—Addition of Filtration Plant—Law.

Shryock v. City of Zanesville et al.—A resolution passed by council of a municipality directing the public service director to employ a competent engineer to prepare plans and specifications for the erection and construction of a mechanical filtration plant for the purification of the water supply of a municipality wherein there was already established and in operation a complete water system does not come within the terms of sections 4 and 5 of article XVIII of the Constitution in so far as such sections relate to the subject of the acquirement, construction, owning, leasing, and operating a public utility by a municipality.—Supreme Court of Ohio, 110 N. E. R., 937.

ferries. By selecting a mixture of buckwheat and bituminous coal, a saving of \$111,963 resulted in the ferry coal bill. The second economy item was a reduction of operating force. This resulted in a saving in 1915 of \$98,770, according to the commissioner. The third reduction of expenses in 1915 was brought about by the removal of the repair shops. This resulted in a saving during the year of \$25,989, to which Mr. Smith added a saving of \$38,723 through not insuring the boats against accident.

NEWS OF THE SOCIETIES

Calendar of Meetings.

March 21-23.—AMERICAN RAILWAY ENGINEERING ASSOCIATION and NATIONAL RAILWAY APPLIANCES ASSOCIATION. Annual meeting and exhibition, Chicago, Ill.

March 23, 24.—FLORIDA STATE GOOD ROADS ASSOCIATION. Annual convention, St. Augustine.

April 8.—AMERICAN WATER WORKS ASSOCIATION (Four-State Section), Atlantic City, N. J.

April 19-22.—NATIONAL CONFERENCE ON COMMUNITY CENTERS AND RELATED PROBLEMS. First conference, New York City. Secretary, John Collier, 70 Fifth Ave., New York.

May 2, 3.—PENNSYLVANIA STATE CHIEFS OF POLICE. Annual convention, Park Hotel, Williamsport, Pa. Secretary, George W. Harder, Williamsport, Pa.

May 8-10.—SOUTHWESTERN WATER WORKS ASSOCIATION. Annual convention, Waco, Tex. Secretary, E. L. Fulkerson, Waco, Tex.

May 10-17.—NATIONAL CONFERENCE OF CHARITIES AND CORRECTIONS. Annual conference, Indianapolis, Ind.

May 31-June 2.—NEW YORK STATE CONFERENCE OF MAYORS. Annual conference, Syracuse, N. Y.

May 31-June 2.—NATIONAL ASSOCIATION OF COMPTROLLERS AND ACCOUNTING OFFICERS. Annual convention, Syracuse, N. Y.

June 4-8.—AMERICAN WATER WORKS ASSOCIATION. Thirty-sixth annual convention, New York, N. Y. Secretary, J. M. Diven, 47 State Street, Troy, N. Y.

June 15, 16.—OHIO SOCIETY OF MECHANICAL, STEAM AND ELECTRICAL ENGINEERS. Convention, Cleveland, O. President, Joseph L. Skeldon, Toledo.

June 28-30.—MICHIGAN LEAGUE OF MUNICIPALITIES. Annual meeting, Battle Creek, Mich.

July 11-13.—MUNICIPAL LEAGUE OF INDIANA. Annual meeting, Goshen, Ind.

Aug. 7-9.—CITY MARSHALS' AND POLICE CHIEFS' UNION OF TEXAS. Annual convention, Houston, Tex.

Sept. 6-9.—LEAGUE OF AMERICAN MUNICIPALITIES. Annual convention, Newark, N. J.

Oct. 9-13.—AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS. Twenty-third Annual Convention, Robert Treat Hotel, Newark, N. J. Secretary, Charles Carroll Brown, 702 Wulsin Building, Indianapolis, Ind.

Oct. 16-21.—NATIONAL SAFETY COUNCIL. Fifth Annual Safety Congress, Detroit, Mich. Secretary, W. H. Cameron, Continental and Commercial Bank, Chicago, Ill.

American Association of Engineers.

The American Association of Engineers announces that it has signed a five-year lease for suite 601-604 at 29 South LaSalle street, Chicago, Ill. This is the second time in nine months the new society has been compelled to enlarge its quarters. It has now a membership of 500, sixty-five per cent. of which is in and near Chicago and the remaining 35 per cent. is scattered throughout the United States, Canada, England, Philippine Islands and even in South America.

Drainage Conference.

"More than \$150,000,000 will be added to the land values in Illinois by pursuing a well considered engineering and legal system of river control and drainage," was the statement of Robert Isham Randolph, consulting engineer of Chicago, at the opening address of the Drainage Conference at the University of Illinois, March 8, 1916. He showed that there are already over 3,-

000,000 acres of land in the state which have been wholly or partly reclaimed most of this being in the uplands where drainage can be had by gravity. In addition there are along the rivers rich lowlands subject to overflow whose area is greater in extent than Holland and capable of supporting a population as great as that of the Dutch kingdom.

Mr. Randolph discussed ways and means of reclaiming the flooded areas along the Illinois and Kaskaskia rivers and pointed out that the engineering problems involved are not insuperable.

A number of representatives of various drainage districts of Illinois who were present pointed out the legal difficulties in the way of any comprehensive drainage plan and need of the enactment of new drainage laws by the state was emphasized.

Other addresses were made by Paul Hansen, Chief Engineer, State Board of Health; W. L. Park, vice president, Illinois Central Railroad; LeRoy K. Sherman, Drainage Commissioner, and John H. Nolan, State Reclamation Commission of Missouri.

National Conference on Community Centers.

One hundred leaders of the community center movement in various parts of the country have joined in calling a conference to thoroughly discuss the problems which are urgent in the community center work in cities and rural districts. The conference will take place in New York City beginning Wednesday evening, April 19, and continuing through Saturday morning, April 22. The headquarters will be the Hotel Astor. There will be two evening sessions, one afternoon and three morning sessions, and divisional conferences at lunch time and through one afternoon.

The main divisions of the conference will be as follows:

1. The Financial Support of Community Center Work.
2. The Community Center and Recreation.
3. The Community Center and Immigration.
4. The Community Center and Public Health.
5. The Demands of Community Center Work on the City Plan.
6. Co-operative Art in the Community Center and the Application of Art Forms to Rural Life.

The above problems will be carefully outlined in reports which will be presented by committees in advance of the conference. They will be discussed at divisional meetings, facilities and time being provided for intimate contact between workers attending the conference. Only in a subordinate way will the conference aim to propagandize on behalf of the

movement. The work of community centers and playgrounds will be carried ahead in New York City without modification in order that reliable observations may be made by those attending the conference. The rapidity of the development of the movement in the last four years and the inadequacy of solutions to the innumerable problems disclosed in this development have made the workers realize the need of vital contact and discussion with the aim of defining an ultimate program.

The provisional officers of the Conference are: President, Luther H. Gulick, M.D.; secretary, John Collier, 70 Fifth avenue, New York City; treasurer, Sam A. Lewisohn. The executive committee consists of Albert Shields, chairman; Jane Pincus, secretary; Carol Aronovici, Alfred G. Arvold, John Collier, Mrs. J. Gilmore Drayton, Haven Emerson, M.D., Jeanette Ezekiels, George B. Ford, Luther H. Gulick, M.D., Rowland Haynes, Frederick C. Howe, Mrs. Paul Kennerday, Burdette G. Lewis, Percy Mackaye, Clarence A. Perry, Fred. M. Stein, Sidney A. Teller, C. B. J. Snyder.

Savannah-Seattle Highway Association.

April 24 and 25 have been decided upon as the dates for the meeting for the organization of the proposed Savannah to Seattle Highway association. The meeting is to be held in Omaha. The good roads committee of the Commercial club, and the Omaha Automobile club, are back of the movement. This meeting is to start the movement definitely to lay out a route from Seattle to Savannah, diagonally across the United States.

Tennessee Conference of Charities and Corrections.

A meeting Sunday afternoon, April 9, at the city auditorium, will mark the formal opening of the Tennessee Conference of Charities and Corrections in second annual session. Gov. T. C. Rye, Amos W. Butler, members of the Indiana State Board of Charities, and Miss Julia Lathrop, head of the children's bureau of the United States Department of Labor, will be the speakers.

In addition to the speakers for the initial session, an acceptance has been received from Dr. Alexander Johnson, of Kansas, who will address the meeting Monday evening on the subject, "The Care of the Feeble Minded." So far, the program for the evening or general sessions is completed and also for the joint sessions. Supt. Hudson, who is in charge of the department on family and the community, has also perfected the program for that section.

The officers of the conference are: J. A. Reichman, president, Memphis; Miss Rebecca Jetton, treasurer, Murfreesboro; J. P. Kranz, secretary, Memphis. The other officers and directors are:

East Tennessee—Mrs. G. H. Jarni-

gan, vice-president, Chattanooga; Judge D. C. Webb, director, Knoxville; John Stagnire, Chattanooga; J. J. Genthner, assistant secretary, Sevierville.

Middle Tennessee—M. T. Bryan, vice-president, Nashville; Rev. T. D. Windiate, director, Nashville; John H. Dewitt, director, Nashville; Miss Cornelia Barksdale, assistant secretary, Nashville.

West Tennessee—J. C. Felsenthal, vice-president, Jackson; Mrs. J. M. McCormick, director, Memphis; J. Frank Warner, director, Jackson; W. C. Davis, assistant secretary, Brownsville.

The conference is divided into departments with a chairman in charge of each as follows:

Child Welfare—Mrs. Mary B. West, chairman.

Family and the Community—R. F. Hudson, chairman.

State and County Institutions—J. S. Denton, chairman.

Penal and Correctional Work—T. C. Thompson, chairman.

Vermont Society of Engineers.

The annual meeting of the Vermont Society of Engineers was held at Burlington, March 9, 1916. After the committee reports given at the afternoon session, the following addresses were delivered:

"The Manufacture of Hydrated Lime in Vermont," G. Z. Thompson, Assistant Superintendent Vermont Marble Company; "The Waterproofing of Concrete," T. W. Dix, Professor of Civil Engineering University of Vermont; "Causes of Failure in Concrete Work," F. O. Sinclair, City Engineer, Burlington, Vt.; "The Engineer's Opinion on Public Questions," Charles Whiting Baker, New York, Editor in Chief, Engineering News; President's address, A. C. Grover, City Engineer, Rutland, Vt.

Following officers were elected: President, H. M. McIntosh, Burlington; vice-president, B. M. Hayward, Montpelier; secretary, G. A. Reed, Montpelier; treasurer, A. E. Winslow, Northfield; director, F. W. Denison, St. Albans.

Indiana Association of Sanitary Engineers.

At the annual convention held at Fort Wayne, March 1 and 2, the following officers were re-elected: William J. Wooley, of Evansville, president; Edward Kanney, of Laporte, vice-president, and P. J. Dolan, of Laporte, treasurer. M. F. Noli and Edward Kanney were elected delegates from the state to the national convention, to be held in June at Atlantic City. The alternates are E. P. Oelschlaeger and William H. Meroff.

The following district chairmen were re-elected: First district, William J. Wooley; Second, A. Lindemann, New Albany; Third, S. D. Miles, Bloomfield; Fourth, H. H. Meerhoff, Richmond; Fifth, Otto A. Tolle, Terre Haute; Sixth, Earl L. Clevenger, Muncie; Seventh, Joseph Hayes, Indian-

apolis; Eighth, T. F. Hipskind, Wabash; Ninth, William Stahr, Fort Wayne; Tenth, C. C. Pyke, Lafayette; Eleventh, P. J. Dolan, Laporte.

American Institute of Electrical Engineers.

The last meeting of the season of the Lynn section, A. I. E. E., was held at Lynn, Mass., March 8. Dr. M. Luckiesh, physicist of the Nela Park laboratory of Cleveland, O., delivered a lecture on "Light, Shade and Color in Illumination."

Dr. Luckiesh began his talk with remarks on the general subject of lighting, showing charts illustrating the distribution of heat and light waves, energy, etc., and the different color effects produced by different lighting systems. The old arc lamp was ideal in some respects, although of course, the amount of light given was of a limited quantity. Much experimenting has been done to get the same effects with the incandescent lamp without much success, however.

He devoted much time to the spectra of different sources of light, showing the effect of such lights on the most common colors. With the ordinary lights, used for domestic purposes, the tendency is to bring out the reds, whereas in daylight the blues are naturally more prominent. The diffusion of light has a good deal to do with

the appearance of objects, and the disposition of lights has a still more pronounced effect.

A large installation of apparatus had been brought on from Cleveland for the purpose of illustrating the lectures and with its aid the effects of different colored lights upon statuary, paintings, etc., were graphically shown. Experiments showing the difference between the mixing of colors by means of pigments and light were of most interest and were a revelation to most of those present, the popular theory being that the effect is the same which, however, proved to be far from being true.

Of especial interest were the experiments with signs or placards, where by means of different colored lights the reading matter could be entirely obliterated or the words brought out in totally different colors. As to matching of colors it was shown different types of lights could so change a color card as to make it unrecognizable.

Carolina Municipal Association.

The annual meeting of the society will be held at Greensboro, N. C., May 4 and 5.

The program, as adopted by the executive committee of the association is as follows:

On Thursday, May 4, the meeting will be called to order by President

(Continued on page 418.)

BOOK REVIEWS

FIRE DEPARTMENT PROMOTION EXAMINATION INSTRUCTION. 337 pages. Civil Service Chronicle, 23 Duane street, New York, N. Y. Price: cloth, \$3.50; paper, \$3.00.

FIRE DEPARTMENT MOTOR APPARATUS. 53 pages. Civil Service Chronicle. Price, \$1.00.

FIRE DEPARTMENT HYDRAULIC PROBLEMS. By Charles Blum. 69 pages, ill. Civil Service Chronicle. Price, \$2.00.

FIRE PREVENTION EXAMINATION INSTRUCTION. By Samuel Rosenblum. 102 pages. Civil Service Chronicle. Price, \$2.00.

These four new volumes, while of particular interest to members and would-be members of the New York Fire Department, contain also a large mass of exceedingly practical information valuable to any fireman anywhere.

The first book in the list contains 750 questions and answers and 1,000 examination questions for promotion to all ranks in the uniformed force, and all bureaus in the department; besides this it has the official instruction of the New York Fire College and the Boston Fire Department. The examinations covered include those given in New York, Chicago, San Francisco, Philadelphia, Newark and Jersey City. The volume therefore is really a practical guide to the duties and everyday work of all grades of fire department

officers, besides being a help to those who would improve their rank in the examinations.

The second volume describes concisely seventeen types of automobile fire apparatus as used in the New York department. It contains the official instruction of the department on the operation and care of apparatus and questions and answers on the theory of auto engine operation. The book therefore forms a useful and convenient manual for those who have charge of motor equipment.

The problems in hydraulics that come up in the work and examination of the firemen very often are handled by memory or rule of thumb and therefore very often inaccurately and carelessly. The third volume mentioned is written to give firemen something of a theoretical basis for their knowledge and to show how these facts and formulas are applied to all kinds of practical problems such as those dealing with friction loss, nozzle discharge, height of streams, pump capacity, etc. Answers to civil service questions furnish good illustrations for the material.

Instruction in fire prevention is growing rapidly in fire departments and therefore the fourth volume should prove a decided help to those interested in the causes of fires, building construction, alarms, sprinklers, combustibles, hazards, types of buildings, etc. The volume contains 650 questions and answers and 200 sections of laws and rules. The fact that the author was formerly chief examiner of the New York Bureau of Fire Prevention makes the volume authoritative.

NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

NEW STREET WASHER.

Sterling-Kindling Motor Squeegee Apparatus.

One of the most interesting exhibits at the recent Pittsburgh road convention was an automobile street washing machine of the latest design which combined the Sterling truck with the Kindling washing apparatus. The machine consists of a special 3½-ton Sterling worm-driven chassis on which is mounted a 1,000-gallon oval-shaped steel tank. Flusher nozzles dampen the dirt, brooms sweep up the heavy matter, sprinkling pipes distribute water for the roller and finally the squeegee removes the matter adhering to the street surface.

The two flusher nozzles are located in front of the front fenders of the chassis and are controlled by the driver by a lever from his seat. These nozzles, by spraying, dampen the street surface and prevent the stirring of the dust. In order that the squeegee be not required to handle too large a mass of material and to loosen the attached dirt, a pair of heavy pavement brooms are fastened immediately behind the nozzles for sweeping the large refuse aside and causing it to be carried off by the water.

Mounted near the center of the chassis frame and immediately underneath is the squeegee or spiral-shaped roller 19 inches in diameter and 8 feet long. The specially treated rubber spirals are firmly attached but easily detachable and are mounted on a special wood holder of large wearing surface. The spirals are adjustable as they wear. The whole attachment is

flexibly mounted and counterbalanced in such a way that it retains uniformly the pressure at which it is adjusted.

In front of the squeegee are jet sprinklers to distribute water for the roller. A toggle joint linkage terminating in a lever in the driver's cab enables him to easily and quickly lift the roller off the street surface when necessary. The roller is driven from the secondary shaft of the transmission through a worm, a wheel and a sprocket and chain.

The tank is supported in four U-shaped cast steel cradles and bands over it. The capacity is designed to serve an ample supply for washing from 3,500 to 5,000 square yards, depending on conditions. The water is gravity fed and is delivered at a 7 to 3 feet head according to level in tank. A water meter is fitted to the tank to act both as a safeguard against idling by the operator and for keeping accurate records. There are four valves in the tank.

The chassis has a unit power plant with motor forward under bonnet, the accessibility of the engine and transmission being particularly assured. Holly springless type carburetor and Eisemann high tension automatic advance magneto are two important features. The clutch is of the multiple dry disc type, faced with raybestos, simple, accessible and positive. Transmission is three speed selective sliding gear type. Tubular drive shaft; horizontal delivery of power through a two-universal joint shaft to overhead type worm axle are distinctive features. The cooling system is by cast aluminum radiator. The brakes are of the self-intensifying type, both sets on rear wheels. The steering gear is

of the irreversible worm and nut type, with six times the bearing contact of the ordinary worm and sector type. The worm-drive rear axle, claimed to deliver 97 per cent. of the power, is silent, dust and oil proof and quickly accessible. The worm, which is of the straight type, and the worm wheel are built of special alloy steels and bronzes. The straight-line drive between the transmission and rear axle gives efficient delivery of power.

The frame is 7-inch pressed steel, inlaid with heavy oak sills, with all members bolted. A very useful feature of the construction of the apparatus is that the roller and tank can be quickly removed and an ordinary truck body of any type mounted on the chassis. This enables the widest use of equipment during off-season periods.

The cleaning capacity of the outfit is calculated to range from 80,000 to 115,000 square yards or about 25 miles a day, depending on the character of the pavement. The speed of the machine is about 7 miles an hour. One of these machines is in use in Milwaukee, Wis. The Municipal Research Bureau of that city recently conducted tests on the motor squeegee, with the following results:

Average sq. yds. cleaned per day..	80,000
Cost per 1,000 sq. yds.....	16.5c.
The assessment per front foot based on a street 30 feet wide and cleaned 50 times a season would be	1.37

The cost data show the operating expense of the horse-drawn and the motor-driven squeegees, and that the latter type will perform twice the amount of work of the former at a reduced unit cost.

An analysis of the traffic condition of the streets cleaned by the squeegees shows that 1,105,324 sq. yds. are subject to this process of cleaning and that from the total yardage the amount of

413,825 sq. yds. should be cleaned 6 times

208,133 sq. yds. should be cleaned 3 times

and 383,365 sq. yds. should be cleaned 2 times each week, or a daily cleaning of approximately 700,000 sq. yds.

The average yardage covered per day by a horse-drawn machine being 35,000 sq. yds., it will require 20 machines, or an additional 8 over the present equipment, to perform the work; but if the motor-driven type were substituted the purchase of only four machines would be necessary.



STERLING-KINDLING STREET WASHING MACHINE.

The difference in operating cost of the two types would be as follows:

Horse-drawn type, average cost per 1,000 sq. yds., 25.5c.

Motor-driven type, average cost per 1,000 sq. yds., 16.5c.

Reduction in cost per 1,000 sq. yds., 9c.

If the motor-driven squeegees were not available, the cost of operating the eight additional horse-drawn machines would be greatly in advance of the motor-driven type, as the following data shows:

8 machines x \$9.635 cost per machine =	\$77.08 x 150 days = \$11,562.00.
By operating these 8 machines it would eliminate the service of	
9 white wings at \$2.00 per day	x 150 days..... \$2,700.00
8 sprinklers at \$6.34 per day x	150 days..... 7,608.00
Total	\$10,308.00

*Twice weekly squeegee cleaning	3,854.00
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Grand total	\$14,262.00
Less the cost of operating 8 squeegees	11,562.00

Effecting a season's saving of	\$2,700.00
4 motor-driven machines x \$13.26 cost per machine x 150 days =	\$7,956.00.
Saving over cost of operating 8 horse-drawn machines =	\$11,562.00—\$7,956.00
or a saving of	\$3,606.00.

With the same services eliminated for the motor-driven as for the horse-drawn squeegee, the total saving would be

\$14,262.00—\$7,956.00 = \$6,306.00.

*This item is included because certain streets are only cleaned twice a week that require the service six times weekly; and if performed the maximum number of times would eliminate the stipulated number of white wings and sprinklers.

The accompanying illustrations show the equipment which is made by the Sterling Motor Truck Company, West Allis, Milwaukee, Wis.

GRADER AND BACK FILLER.

A New "Oshkosh" Machine for Many Purposes.

The "Oshkosh" back filler is essentially a small gasoline engine driven

hoisting machine which is useful for any sort of work to which a gasoline engine and a hoisting engine flexibly mounted can be put. Its general use is for grading and backfilling and it is claimed that with three men this convenient machine can do the work of ten. Only one man is needed to run the engine and boss the work and one or two men work the grading scoop.

Being a self-tractor it moves along with the work, yet has sufficient weight to anchor it to the ground for side haulage of heavy scoop loads. The power is from a 6 h. p., 4-cycle, Novo gasoline engine. This gives all the necessary power for forward and reverse traction and the grading at a low cost of operation. The outfit has one speed ahead and reverse, 105 feet per minute. Starting is through a powerful multiple disc clutch.

The drive is chain to the drum which is equipped with ratchet and pawl and brake, the cable speed 125 feet per minute. The cable runs from drum to swinging sheave allowing direct pull on scraper from any point. The drum clutch and sheave are brass bushed and fitted with oil reservoirs. Control is by three levers, one each for operating drum, ratchet and pawl and brake.

The frame measures 72x40 inches and is constructed of 6x8-inch channels and the engine is supported by 5x6½-inch channels. The three point suspension is a useful feature in running over rough ground. Rear wheels are 28 inches and front wheels 24 inches in diameter, equipped with 5-inch tires. The weight of the outfit is 2,850 pounds.

Some of the uses to which the equipment can be put by contractors are: Back filling trench work, highway excavating and filling, pulling cables through conduits, stretching electric wire, pulling sheet piling, extricating mired material wagons, lowering pipe into trench, unloading pipe from wagons, removing rock from trench and for general hoisting purposes.

The accompanying illustration shows

the machine at work. It is made by the Oshkosh Manufacturing Company, 95 Bridge street, Oshkosh, Wis.

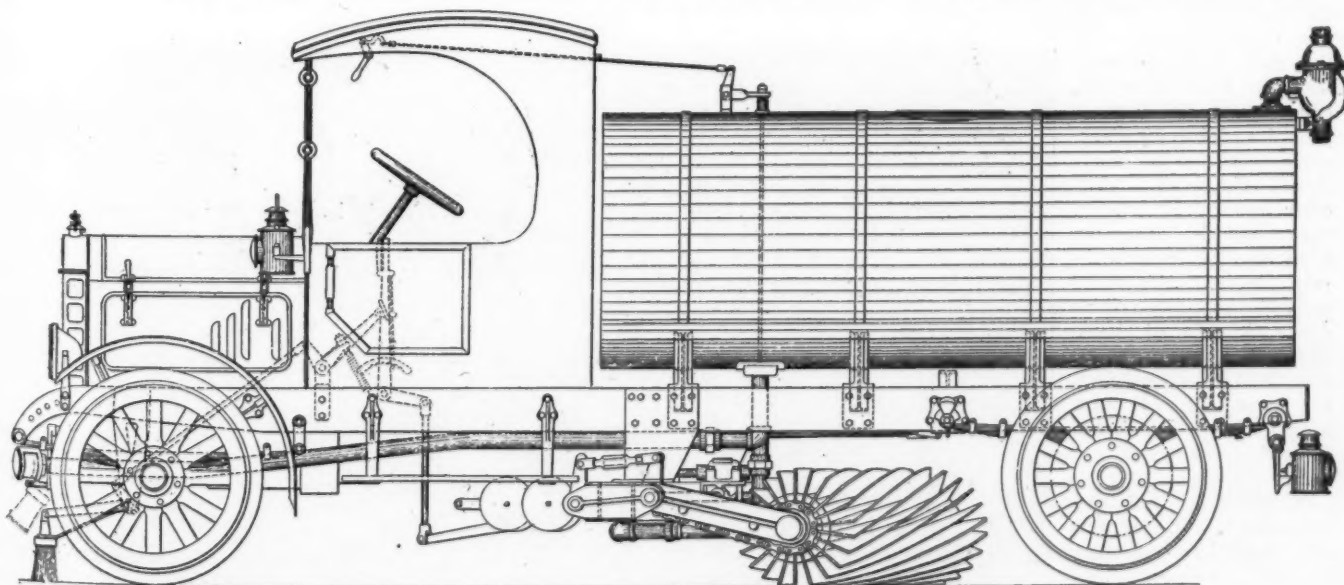
INDUSTRIAL NEWS

Freight Rates on Cast Iron Pipe.

New rates on cast iron pipe in carloads from Charlotte, N. C., to Pacific coast terminals, recently suspended until June 13, 1916, have been canceled by the Interstate Commerce Commission, but the carriers have been authorized to establish a rate which shall not exceed that from Chattanooga, Tenn., or Birmingham, Ala., by more than 5c per 100 lbs. Soil or sanitary pipe is made at Charlotte but no water or gas pipe.

The Standard Scale & Supply Company has removed from 243 and 245 Water street to 1631 Liberty avenue, Pittsburgh, where it will occupy a building which affords better facilities. The new location is near the freight stations of all the railroads entering the city. The New York office of the company has been removed from 136 West Broadway to 145 Chambers street. Its products are scales, trucks, concrete mixers and general contractors' equipment.

Cast Iron Pipe.—Chicago—Present lettings include 4,300 tons at Cleveland, Ohio; 1,200 tons at Jackson, Mich., and 1,000 tons at Salt Lake City. At St. Louis all bids were rejected and new ones are being asked on 7,200 tons. Quotations: 4-inch, \$32.50 to \$33; 6-inch and larger, \$29.50 to \$30; Class A, \$1 extra. Birmingham manufacturers are operating on a very satisfactory schedule, with a regular flow of orders and inquiries. J. R. McWane, of the American Cast Iron Pipe Company, is still studying the South American situation, recently in Buenos Ayres and Rio Janerio. Quotations: 4-inch, \$28; 6-inch and up, \$25; 16-foot lengths, \$1 extra. San Francisco—City of Los Angeles has placed a contract for 2,700 tons



OUTLINE VIEW SHOWING CONSTRUCTION OF STERLING-KINDLING STREET WASHER.

with the United States Cast Iron Pipe Foundry Company, and Glendale, Cal., has ordered 400 tons of 20-inch. Prices are firmly held as for several weeks. New York—The Department of Water, Gas and Electricity of New York City has opened bids, March 16, on 1,230 tons of 4 to 20-inch pipe and 60 tons of fittings. The same department on March 20 opened bids on two contractors' jobs in Staten Island involving a total of 515 tons of pipe and 20 tons of fittings. The United States Cast Iron Pipe Foundry Company was lowest bidder on the Atlantic City contract for 2,500 tons of pipe for high pressure service. Inquiries continue steadily and there is a good volume of private buying. Quotations: 6-inch, Class B and heavier, \$29.50; Class A, \$30.50.

Lead.—The market has gone beyond all restraint. For shipment on the Pacific coast 8 cents has been asked, while St. Louis quotes higher than New York. Quotations: New York, 7.25 cents; St. Louis, 7.375.

Road Machine Sales.—The Pennsylvania State Highway Department has let a contract for five additional road-making machines to the Galion Iron Works, Galion, Ohio, and two to the J. B. Company, Indianapolis, Ind.

The Sterling Motor Truck Company, Milwaukee, Wis., is materially increasing its plant capacity, the new buildings being practically ready for occupancy. This company has developed, in the design of its several sizes of trucks, from 1500 lb. to 7 tons, an interchangeability and a uniformity of parts that have materially enhanced production efficiency in manufacture.

The Goodyear Tire and Rubber Company, Akron, O., announces that its offer to refund the entire purchase price if Goodyear S-V tires fail to cost less per mile than competitive makes, will terminate April 1, 1916, at the completion of a full year's test. The offer was: "Equip opposite wheels—at the same time—one with a Goodyear S-V and one with any other standard truck tire of like rated size, bought in the open market. If the S-V fails to cost less per mile than the other, we will return you its full purchase price, making the S-V free." Originally this offer was made to cover three months, but the time was twice extended. So far, it is said, only five of all the hundreds of S-V's sold having failed to outwear any other. The owners of these five did not want the cash rebate, but asked for new tires, and got them.

The White Company, Cleveland, O., states that for the first time in the motor truck industry, a solid train shipment of high grade motor trucks,

intended exclusively for commercial service, was despatched from Cleveland to the Pacific coast. This special train, composed of twenty-one freight cars containing 54 trucks, was sent out by the White Company. The size of this shipment is second only to the train-load shipments of motor trucks for export purposes which have been sent to Atlantic coast ports. All of the trucks on this train, ranging in capacity from 1,500 pounds to five tons, have been purchased by business firms. The trucks are destined for San Francisco, Los Angeles, Portland, Seattle, Tacoma and other coast points. Part of the shipment will go to augment existing fleets and others will enter the service of firms which have not used trucks heretofore.

NEWS OF THE SOCIETIES

(Continued from page 415.)

T. J. Murphy, mayor of Greensboro, at 10 o'clock a. m.

Address of welcome, by Fred I. Sutton, mayor of Kinston; response, by Mayor James I. Johnson, of Raleigh.

Annual address, by President T. J. dress, "Progress of Southern Municipalities," by R. H. Edmonds, editor of the Manufacturers' Record, Baltimore.

In the afternoon will be given "Police Efficiency," by D. Hiden Ramsey, commissioner of Asheville; "Fire Prevention and Protection," by James D. McNeill, ex-president National Firemen's Association, Fayetteville; Address, by T. W. Bickett, attorney general of North Carolina; election of officers.

Friday morning will be given "City School System," J. L. Mann, Ph.D., superintendent of schools, Greensboro; "Legislation," T. L. Kirkpatrick, mayor of Charlotte; "Public Health," Dr. J. M. Parrott, ex-president North Carolina Medical Association, Kingston; "City Planning," O. B. Eaton, mayor of Winston-Salem; "Commission Government," by the mayor of Birmingham, Ala.

On Friday afternoon there will be an automobile ride, 2 to 3.

"Transportation," by J. K. Wilson, city attorney of Elizabeth City; "Parks and Playgrounds," J. C. Gibbs, mayor of Fayetteville; "Streets and Roads," P. Q. Moore, mayor of Wilmington; address and exhibition, by Edward Young Clark, secretary Atlanta chamber of commerce. On Friday night, banquet and address, by Claude Kitchin, leader of House of Representatives of the National Congress.

PERSONALS

The following officers have been elected in Vermont:

Bridport—Moderator, J. C. S. Hamilton; clerk, J. H. Howe; treasurer, D. H. Bennett; selectmen, C. D. Norton, J. F. Buckett, E. D. Myrick; road commissioner, E. D. Payne.

Middlebury—Moderator, James B. Donaway; clerk, J. M. Burke; treasurer, C. E. Pinney; selectman and lister, Fred Brookings; road commissioner, E. Leroy Sessions.

Montpelier—Moderator, James M. Boutwell, elected mayor third time; H. C. Shurtleff, alderman, ward 3; ward 4, James P. Gallegher; ward, 5, P. H. Ryan; ward 6, Willis M. Parker.

Swanton—Moderator, A. D. Bellows; clerk, O. E. Loiselle; treasurer, G. L. Loiselle; selectmen, J. C. Kelley, C. C. Dettit, M. W. Barney; road commissioners, Gilbert Therrien, John Callan. St. Albans—Mayor, John E. Maun, aldermen, A. A. Parmalee, F. A. Walker, S. C. Greene.

Brattleboro—Moderator, A. F. Shrink; clerk, Carl M. Hopkins; treasurer, W. H. Brackett; selectmen, re-elected Arthur E. Merrill; road commissioner, Warren L. Walker.

Muscatine, Ia.—Dr. R. S. McNutt, mayor.

Leatherwood, W. Va.—Mayor, J. W. Ewing; recorder, T. C. Moffat; sergeant, Isaac Degarmo; members of council, D. H. Wagner, R. C. Dalzell and J. J. Holloway.



OSHKOSH GRADER AND BACK-FILLER.

ADVANCE CONTRACT NEWS

ADVANCE INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS				
Wis.	Racine	10 a.m., Mar. 25	Paving streets—seven jobs	Board of Public Works.
Fla.	Deland	Mar. 25	Constructing 36 miles of road	M. M. Bond, Ch. County Comr.
Ind.	Muncie	Mar. 25	2 miles of road and culverts, cost \$16,000	S. H. Weber, Co. Surveyor.
O.	Wauseon	10 a.m., Mar. 25	5½ miles road improvement	W. W. Ackerman, Co. Aud.
Fla.	Kissimmee	Mar. 25	Paving with brick	J. R. Gilbert, City Clerk.
Mass.	Everett	8 p.m., Mar. 27	Furnishing road oil and bituminous binders	A. A. Thompson, Ch. Bd. Pub. Wks.
Ind.	Ellwood	8 p.m., Mar. 27	Constructing concrete sidewalk	Eph. Rummel, City Clerk.
Col.	Castle Rock	10 a.m., Mar. 27	Constructing state highway	Clk. Co. Commissioners.
Minn.	St. Paul	10.30 a.m., Mar. 27	Paving and curbing streets and furnishing paving materials including brick, 5,476 bbls. Portland cement and 28,744 yds. creosoted wood block	August Hohenstein, Pur. Agt.
N. J.	Avon-by-the-Sea	Mar. 27	80,000 sq. ft. concrete sidewalks, curbs, etc.	J. M. Emlen, 221 Main St.
Conn.	Stamford	8 p.m., Mar. 27	Furnishing bluestone curbing, about 10,000 lin. ft.	J. H. Provost, City Clerk.
N. J.	East Orange	8 p.m., Mar. 27	1,400 sq. ft. concrete sidewalk	L. E. Rowley, City Clerk.
La.	Perry	8 p.m., Mar. 27	30,000 sq. yds. first-class pavement	C. E. Wilson, City Engr.
O.	Jefferson	Mar. 27	Improving road	B. E. Brainerd, Clk. Co. Comr.
N. Y.	New York	10.30 a.m., Mar. 27	Furnishing 7,000 cu. yds. of grits, 400,000 gals. tar road oil and 2,000 cu. yds. paving sand	Douglas Mathewson, Pres. Bor. Bronx.
Tex.	Denison	2 p.m., Mar. 27	13,000 sq. yds. asphaltic concrete or reinforced concrete pavements with curb and gutter	A. B. Clenny, City Engineer.
R. I.	Providence	2.15 p.m., Mar. 27	Furnishing 150,000 improved granite blocks and 150,000 ordinary granite blocks	W. C. Pelkey, Secy. Board of Contract & Supply.
Minn.	Winona	8 p.m., Mar. 27	Furnishing 10-ton road roller and dustless pick-up street cleaner	Geo. Hofmann, City Recorder.
Ind.	Crawfordsville	Mar. 27	Paving road	C. M. Harlan, Clk. Bd. of Pub. Wks.
N. J.	Montclair	Mar. 27	Furnishing and applying road oil and asphalt	Harry Trippett, Town Clerk
La.	New Orleans	Mar. 27	Constructing gravel roads	W. E. Atkinson, St. Hwy. Engr.
Ind.	South Bend	Mar. 27	Constructing roads, cost \$18,600	A. Wolf, Auditor.
N. J.	Bayonne	Mar. 28	Asphalt, bituminous concrete and granite block pavement; cost, \$200,000	W. L. Clarkson, City Engr.
S. C.	Sumter	Mar. 28	Street paving; cost \$225,000	W. L. Lee, City Engineer.
O.	Columbus	noon, Mar. 28	Grading, curbing and paving road	John Scott, Clerk, Co. Comr.
N. Y.	Albany	1 p.m., Mar. 28	Furnishing bituminous material "A" and "T" and cold patch emulsion	Edwin Duffey, St. Hwy. Comr.
Minn.	Bemidji	2.30 p.m., Mar. 28	Ditching, grading and surfacing roads	J. L. George, Co. Aud.
Ind.	South Bend	10 a.m., Mar. 28	Constructing pavements	V. Sweeney, Clk. Bd. P. Wks.
Minn.	Hallok	2 p.m., Mar. 28	Seven jobs of state road work	James Davnie, Co. Auditor.
O.	Youngstown	Mar. 28	Constructing 8½ miles slag macadam road	F. H. Vogan, Clk. Co. Comr.
Ont.	Toronto	Mar. 28	Crushed stone and treated wood block	R. C. Harris, Comr. of Wks.
La.	Ortonville	Noon, Mar. 28	7 jobs state road work, requiring 25,530 cu. yds. of grading, and 60,350 ft. of turnpiking	A. V. Randall, Co. Aud.
Neb.	Kearney	2 p.m., Mar. 28	Paving in several streets	T. N. Hartzell, City Clerk.
Wis.	Washburn	7.30 p.m., Mar. 28	Paving with first class pavement	J. A. Sheridan, Pres. Bd. Pub. Works.
Wis.	Columbus	2 p.m., Mar. 28	Paving with concrete, brick or asphalt concrete on several streets	City Clerk.
Ind.	Michigan City	10 a.m., Mar. 28	Paving several streets	Alexander Spychalski, City Clerk.
Pa.	Philadelphia	Mar. 28	Grading, paving and repaving; cost, \$405,500	W. H. Connell, Ch. Bureau of Highways.
Wis.	Washburn	7.30 p.m., Mar. 28	Laying first class pavement on several streets	Board of Public Works.
Mass.	New Bedford	10 a.m., Mar. 29	300,000 gals. bituminous road oil and binder, 300 tons asphaltic cement, 50,000 gals. non-asphaltic road oil, 7,500 lbs. Portland cement, 15,300 tons broken stone and screenings, 15,000 ft. granite curbing, 15,000 sq. yds. granite paving blocks, 10,000 tons of sand, 200 sewer castings and 10,000 sq. yds. granolithic sidewalks	W. P. Hammersley, Supt. of Sts.
Ind.	Anderson	10 a.m., Mar. 29	Gravel or macadam highways	E. T. Flahavin, Co. Aud.
Ill.	Hardin	11 a.m., Mar. 29	Constructing waterbound macadam, cost \$3,000	State Highway Comr., Springfield.
O.	Canton	Mar. 29	Constructing brick and macadam roads	U. C. Schick, Co. Clerk
Minn.	Madison	3 p.m., Mar. 29	Constructing roads, requiring 36,000 cu. yds. of grading	A. G. Shogren, Co. Auditor.
Minn.	Aitkin	1 p.m., Mar. 29	Grading 2½ miles of state road	H. C. Beecher, Co. Auditor.
Ind.	Albany	Mar. 30	Constructing road	Emile Dupaquier, Co. Aud.
W. Va.	Hinton	10 a.m., Mar. 30	Constructing 28,700 ft. first class pavement and grading and draining 2.6 miles	Phillip Konrad, Engr., Kanawha Falls.
Ont.	Barrie	Mar. 30	Supplying road oil for 1916	J. S. Laing, Town Engr.
W. Va.	Morgantown	Mar. 30	Constructing brick and concrete road	W. S. Downs, Engineer.
N. D.	Steele	2 p.m., Mar. 30	Grading county road	J. C. McWhinney, Co. Auditor.
Wis.	Waukesha	Mar. 30	Constructing 11,000 yds. asphalt macadam; cost, \$15,000	William Pourie, City Engineer.
N. J.	Newark	3.30 p.m., Mar. 30	Paving and repaving with asphalt, wood block and granite block and constructing granite curbs and cement sidewalks	M. R. Sherrerd, Chief Engr.
Neb.	Kearney	Mar. 30	Paving streets	T. N. Hartzell, City Clerk
Tenn.	Maryville	Mar. 30	75 miles of grading and 70 miles macadam or gravel roads	J. W. Harmon, Ch. Engr.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
O.	Tiffin	Mar. 31.	3 1/2 miles macadam road.	J. I. Oberlander, Engr.
Ill.	Geneva	5 p.m., Mar. 31.	Brick pavement and concrete curb and gutter.	A. L. Stimple, City Clerk.
Ala.	Dothan	Mar. 31.	Constructing 15 miles of road.	W. R. Koonce, Co. Engr.
N. Y.	New York	2 p.m., Mar. 31.	Filling and grading in the Borough of Bronx.	William Williams, Comr. W. S. G. & E.
Mo.	St. Louis	noon, Mar. 31.	Paving and improving several streets.	E. R. Kinsey, Pres. Bd. P. W.
W. Va.	Charleston	Noon, Mar. 31.	16,865 sq. yds. of paving; curbing and grading.	B. A. Wise, City Mgr.
Mich.	Ontonagon	Noon, Mar. 31.	Constructing 6.66 miles gravel road.	J. B. Haskins, Clk. Twp. Bd.
Minn.	Windom	1 p.m., Mar. 31.	Elevating road grader, 10 dump wagons and corrugated culverts.	Ole Osland, Ch. Co. Comrs.
Minn.	Walker	10.30 a.m., Apr. 1.	Constructing 8 miles road; cost, \$800.	C. D. Bacon, Co. Auditor.
Sask.	Moose Jaw	Apr. 1.	Paving approaches to freight sheds.	C. S. Moss, Res. Engr., C. P. R.
Wash.	Pomeroy	Apr. 1.	20,000 yds. pavement and 7,600 ft. curb and gutter; cost, \$75,000.	J. E. Tupper, City Engineer.
Tenn.	Morristown	Apr. 1.	Constructing roads, cost \$150,000.	H. B. Havely, Engineer.
W. Va.	Charleston	Apr. 1.	16,000 yds. brick pavement.	N. Clark, City Engr.
Ill.	Edwardsville	2 p.m., Apr. 1.	Constructing 6,000 ft. concrete road.	Ed. of Highway Comrs.
O.	Dayton	Apr. 1.	7,000 gals. road oil and 5,200 yds. excavation.	W. H. Aszling, Clk. Co. Comra.
Wash.	Okanagon	Apr. 1.	Constructing gravel road, cost \$12,000.	H. E. Smith, Co. Engr.
Wash.	Walla Walla	Apr. 1.	100,000 sq. yds. hard surface pavement.	W. R. Rehorn, City Engr.
Ky.	Greenville	Apr. 1.	6 miles of street, cost \$22,500.	avor.
Ind.	Hartford City	Apr. 1.	Constructing macadam roads; cost, \$125,000.	F. P. Wallace, Co. Engr.
Wis.	New London	2 p.m., Apr. 2.	26,000 sq. yds. reinforced concrete pavement (material already purchased).	C. J. Thompson, City Clerk.
N. D.	Aneta	8 p.m., Apr. 3.	Cement walks, crosswalks and culverts for 1916.	E. H. Lowen, City Aud.
N. D.	Carrington	8 p.m., Apr. 3.	Cement sidewalks and crosswalks for 1916.	H. L. Winterer, City Aud.
N. D.	Granville	6 p.m., Apr. 3.	Constructing sidewalks during 1916.	C. J. Krogfoss, City Aud.
N. D.	Wahpeton	7.30 p.m., Apr. 3.	Constructing walks, curbs and gutters for 1916.	S. H. Murray, City Aud.
Minn.	Park River	7.30 p.m., Apr. 3.	Crosswalks and sidewalks for 1916.	F. J. Prochaska, City Aud.
Minn.	St. Paul	10 a.m., Apr. 3.	300 to 800 tons road asphalt and 50,000 gals asphalt road oil (40%).	G. J. Ries, County Auditor.
Ill.	Edwardsville	2 p.m., Apr. 3.	Constructing 2,300 ft. concrete road.	Board of Highway Comrs.
Ind.	Rockport	Apr. 3.	7.9 miles rock road.	J. F. Stocking, Co. Auditor.
O.	Springfield	Apr. 3.	Paving two streets.	W. J. Barrett, City Aud.
Minn.	St. Paul	10 a.m., Apr. 3.	Oil distributor and force pump; grading and improving roads.	G. J. Ries, Co. Aud.
Pa.	Franklin	4 p.m., Apr. 3.	14,000 sq. yds. wire-cut brick.	City Clerk.
Ky.	Earlington	Apr. 3.	One mile macadam streets.	W. E. Roth, Mayor.
Wis.	Manitowoc	4 p.m., Apr. 3.	One or more cars of road oil.	J. J. Kelley, City Clk.
Ala.	Monroeville	Apr. 3.	Grading, draining and graveling road.	C. E. Barker, Co. Engr.
N. D.	Grafton	6 p.m., Apr. 3.	Sidewalks and street and alley crossings for one year.	J. H. Johnson, City Auditor.
Ind.	Kentland	2 p.m., Apr. 3.	Grading, paving and improving roads (2 jobs).	S. R. Sizelove, Co. Aud.
Ind.	Greenfield	10 a.m., Apr. 3.	Grading, paving and improving road.	H. J. Rhue, Co. Aud.
Ind.	Jasper	2 p.m., Apr. 3.	Grading, paving and improving roads.	J. H. Seng, Co. Aud.
N. D.	Mandan	10 a.m., Apr. 3.	Concrete mixer, scrapers, graders and road ploughs.	Lee Nichols, County Auditor.
S. D.	Huron	Apr. 3.	Paving Dakota Avenue.	S. S. Oviatt, City Auditor.
N. D.	Sherbrooke	2 p.m., Apr. 3.	Constructing roads.	G. J. Mustad, County Auditor.
Mass.	Revere	Noon, Apr. 3.	Constructing 4,500 sq. yds. granolithic sidewalk.	C. G. Richmond, Supt. Public Works.
Minn.	Elbow Lake	10 a.m., Apr. 3.	67,000 cu. yds. grading and 60,000 linear ft. turnpiking.	C. M. Nelson, Co. Aud.
Ga.	College Park	Apr. 3.	1,500 sq. yds. tile or concrete walks.	W. M. Alexander, Clk.
O.	Salem	Noon, Apr. 3.	6,620 yds. brick pavement.	I. N. Russell, Dir. Pub. Serv.
Ind.	Rushville	2 p.m., Apr. 3.	Constructing road.	A. R. Holden, Co. Aud.
Ind.	Sheldon	Apr. 3.	Roadwork during 1916.	County Supervisors.
Ala.	Camden	Apr. 3.	Constructing gravel or sand-clay road (3 3/4 miles).	Blair Hughes, Supv. of Roads.
N. D.	Rugby	Apr. 3.	Constructing sidewalks during 1916.	T. B. Torson, City Auditor.
N. D.	Williston	8 p.m., Apr. 3.	Constructing sidewalks and crossings during 1916.	G. G. Harvey, City Auditor.
Ind.	South Bend	10 a.m., Apr. 4.	Paving several streets.	Veronica Sweeney, Clk. Bd. Pub. Wks.
S. D.	McIntosh	2 p.m., Apr. 4.	Dragging and maintaining county road.	R. E. Smith, Co. Aud.
O.	Bryan	Apr. 4.	Constructing slag or macadam roads.	County Comrs.
Minn.	Wheaton	Noon, Apr. 4.	7 state road jobs, requiring 9,300 cu. yds. excavation and 112,500 lin. ft. turnpiking; concrete and metal culverts.	J. T. Erickson, Co. Aud.
Ind.	Rensselaer	2 p.m., Apr. 4.	Grading, paving and improving road.	J. P. Hammond, Co. Aud.
O.	Decatur	10 a.m., Apr. 4.	Macadamizing road.	T. H. Baltzell, Co. Aud.
O.	Columbus	Noon, Apr. 4.	1,500 tons lake sand, 120 tons of refined asphalt, 150 tons limestone dust, and 8,000 gals. asphalt flux.	G. A. Borden, Pres. Bd. Pur.
Ind.	Redford	1 p.m., Apr. 4.	Grading, paving and improving roads.	E. M. Edwards, Co. Aud.
Ind.	Washington	2 p.m., Apr. 4.	Grading, paving and improving roads (2 jobs).	J. G. Clark, Co. Aud.
Ind.	Winamac	Noon, Apr. 4.	Grading, paving and improving roads.	W. E. Munchenberg, Co. Aud.
Ind.	Noblesville	10 a.m., Apr. 4.	Grading, paving and improving roads.	W. D. Horton, Co. Aud.
O.	Wooster	Noon, Apr. 4.	1,990 ft. brick pavement.	Max Bloomberg, Dir. Public Service.
Mich.	Reeman	10 a.m., Apr. 5.	Constructing 9 miles of gravel road.	J. M. Beem, Clk. Township Bd.
Minn.	Stuntz	Apr. 5.	Improving 2 miles of road.	Town Board.
Ind.	Muncie	10 a.m., Apr. 5.	Constructing gravel or macadam highways.	F. M. Williams, Co. Aud.
N. J.	Freehold	Apr. 5.	Constructing and repairing roads and bridges.	C. E. Close, Clerk.
Ind.	Shelbyville	10 a.m., Apr. 5.	Furnishing 2,000 yds. crushed stone; constructing 3 miles of gravel road.	F. W. Fagel, County Auditor
Ind.	Huntington	Apr. 5.	Constructing two roads.	County Commissioners.
Ind.	LaPorte	Apr. 5.	Constructing roads.	County Auditor.
Ind.	Indianapolis	10 a.m., Apr. 6.	Constructing gravel road.	L. K. Fesler, Co. Aud.
Ind.	Jefferson	1 p.m., Apr. 6.	Spreading gravel on road.	J. E. Snodgrass, Clk. Twp. Tr.
W. Va.	Wheeling	Aug. 6.	Paving 10 miles of road, cost \$200,000.	Oliver & Maupin Engineering Co.
W. Va.	Huntington	Apr. 6.	Paving 10 miles with brick.	Oliver & Maupin Engrs. Co.
Ark.	Jonesboro	2 p.m., Apr. 6.	13 miles asphalt road on gravel base and 3 miles gravel road.	Lund & Hill, Engineers, Little Rock.
O.	Cincinnati	noon, Apr. 7.	Setting granite curbs, paving with asphalt and constructing drains and inlets.	Frank Krug, City Engineer.
Wash.	Pomeroy	Apr. 7.	28,000 sq. yds. first class pavement, 7,500 ft. curb and gutter and 7,500 cu. yds. excavation.	Harry St. George, City Clerk.
Mich.	Coldwater	1.30 p.m., Apr. 10.	One mile of concrete road.	County Road Comrs.
Fla.	Bronson	Apr. 10.	29 1/2 miles of road.	A. T. Hardee, Co. Clerk.
Fla.	Eustis	4 p.m., Apr. 10.	Constructing pavements.	Isham Randolph & Co., Engineers, Jacksonville, Fla.
O.	Euclid	Noon, Apr. 10.	Grading, curbing and paving with brick or asphalt and constructing sidewalks.	F. A. Pease Engineering Co.
Minn.	Hastings	2 p.m., Apr. 11.	Grading 2 1/2 miles of road.	Marshall Bldg., Cleveland.
O.	Akron	11 a.m., Apr. 11.	Paving and macadamizing roads (3 jobs).	P. A. Hoffman, Co. Auditor.
Ind.	Indianapolis	10 a.m., Apr. 11.	Grading, paving and improving road.	U. G. High, Clk. Co. Comrs.
N. C.	Gastonia	Apr. 12.	Tarvia binding and repair work.	L. K. Fesler, Co. Aud.
Wash.	Palouse	Apr. 12.	19,000 yds. concrete paving, cost \$30,000.	O. G. Falls, Kings Mountain.
O.	Salem	Apr. 13.	6,620 yards brick pavement, cost \$14,000.	J. J. Johnson, City Clerk
S. C.	Charleston	6 p.m., Apr. 14.	Curbing, constructing sidewalks and furnishing paving material during 1916.	Director of Pub. Service
				J. H. Dingle, City Engr.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ind., North Vernon	Apr.	14..	4,732 yds. first class pavement.....	Charles Miles, City Engr.
Ky., Elkton	Apr.	15..	8 miles macadam road, cost \$24,000.....	A. B. Wilkins, Co. Judge.
Mich., Houghton	Noon, Apr.	15..	13 miles of macadam road.....	R. Martin, Engineer.
O., Wooster	Apr.	15..	Improving streets.....	O. A. Glerow, City Engr.
Pa., Hazleton	Apr.	15..	40,000 yds. brick or other paving, cost \$89,000.....	B. E. Youngman, City Engr.
O., Batavia	Apr.	15..	Constructing three miles of pavement.....	L. H. Lersh, Engineer, State Hwy. Dept., Columbus.
Okla., Lawton	2 p.m., Apr.	18..	Constructing driveway, sidewalk, curb and gutters.....	R. P. Sanders, Comr. Public Property.
Fla., Bartow	Apr.	18..	240 miles brick, asphalt and asphaltic concrete roads, cost, \$1,000,000.....	H. S. Jaudon Engineering Co., Savannah, Ga. (and Box 384 Bartow, Fla.)
Fla., Sarasota	Apr.	20..	Grading 19 miles; 28 miles sand-asphalt road.....	County Commissioners.
Ala., Lafayette	Apr.	24..	Constructing 16 miles sand-clay roads.....	J. J. Robinson, Jr., Probate Judge.
O., Gallon	May	1..	Paving Grove Avenue; cost \$30,000.....	A. F. Unckrich, Dir. Pub. Serv.
Minn., Eveleth	May	1..	Paving streets; estimated cost \$20,000.....	C. H. Williams, City Clerk.
Ind., South Bend	May	1..	Paving 21 blocks, cost \$70,000.....	Board of Public Works.
Neb., Winlock	May	1..	One mile concrete pavement; cost, \$12,000.....	City Clerk.
Ky., Greenville	June	1..	Six miles macadam and dirt road, \$20,000 available.....	J. N. Fentress, Co. Clerk.
SEWERAGE				
Wis., Sheboygan Falls	8 p.m., Mar.	25..	11,200 ft. 8 to 15-in. tile sewers.....	J. Donahue, Engr., York Bldg.
N. C., Lillington	2 p.m., Mar.	27..	15,000 ft. 8-in. terra cotta pipe, manholes and flush tanks and 34,000 hard brick.....	J. B. McCrary Co., Engineers, Atlanta, Ga.
N. Y., L. Island City	11 a.m. Mar.	27..	Constructing sewers in several streets, 12 to 60-in., vitrified and concrete.....	M. E. Connolly, Boro Pres.
Minn., St. Paul	10.30 a.m., Mar.	27..	Constructing sewers and furnishing materials.....	August Hohenstein, Pur. Agt.
Okla., Tonkwa	2 p.m., Mar.	27..	7,500 ft. 4 and 6-in. pipe sewers, manholes and flush tanks.....	E. H. Stalmaker, City Clerk
Wis., Randolph	2 p.m., Mar.	27..	Constructing 16,300 ft. 8 to 12-in. sanitary sewers, 60 manholes, 4 flush tanks, 1,370 ft. 8-in. c. i. pipe and 1 sewage disposal plant.....	W. S. Shields, Engineer, Hartford Bldg., Chicago.
Conn., Salisbury	8 p.m., Mar.	27..	Laying 22,900 ft. 8 to 15-in. vitrified sewers, 1,900 ft. 8 to 14-in. c. i. sewers and sewage disposal plant.....	A. C. Roberts, Ch. Sewer Com., Lakeville, Conn.
Ia., Des Moines	Noon, Mar.	28..	Constructing drain No. 13.....	F. J. Alber, Co. Aud.
Ind., South Bend	Mar.	28..	Constructing sewer, cost about \$900.....	Board of Public Work.
Colo., Boulder	5 p.m., Mar.	28..	Laying 2,955 ft. 12 to 42-in. storm sewers.....	City Engineer.
Wis., Kohler	8 p.m., Mar.	28..	1,000 ft. 8-in. vitrified sewer.....	Walter Roder, Village Clerk.
N. Y., Rochester	11 a.m., Mar.	29..	Installing wiring system, screens, etc. and erecting steel at sewage disposal plant.....	City Engineer.
Kans., Anthony	1 p.m., Mar.	30..	Main and intercepting sewers, disposal plant and lateral system.....	W. R. Canaan, City Clerk.
N. Y., New York	10.30 a.m., Mar.	30..	Constructing several long sewers, 12 to 96-in. (mostly concrete).....	Douglas Mathewson, Pres. Bronx Boro.
O., Lakewood	Noon, Mar.	30..	Constructing sewage treatment plant.....	N. C. Cotabish, Dir. Pub. Wks.
Minn., Litchfield	Mar.	30..	Constructing sewers.....	Village Clerk.
Wis., Madison	Mar.	31..	One or two sewage disposal plants.....	E. E. Parker, City Engr.
N. Y., Ft. Washington	3 p.m., Mar.	31..	Sewer system.....	F. B. Smith, Ch. Sewer Comrs.
Ill., Geneva	5 p.m., Mar.	31..	Storm water sewers.....	A. L. Stimpfle, City Clerk.
N. Y., Buffalo	11 a.m., Apr.	1..	8-ft. brick sewer.....	A. W. Kreinheder, Supt. Pub. Works.
Tenn., Morristown	4 p.m., Apr.	1..	Furnishing vitrified drain pipe.....	H. B. Havely, Engineer.
Tex., Childress	Apr.	1..	Sewerage system disposal plant, cost \$30,000.....	R. G. Carraway, City Engr.
Wis., N. Milwaukee	Apr.	1..	Sewer system, cost \$14,000.....	H. C. Webster, City Engr.
O., Ada	Apr.	1..	Constructing sewers; cost about \$40,000.....	T. J. Smull, City Engineer.
Wis., N. Milwaukee	Apr.	1..	Constructing sewer system; cost \$14,000.....	H. C. Webster, Engineer.
Ill., Mattoon	Apr.	1..	6,100 ft. 24 to 30-in. tile.....	C. L. James, Engineer.
Ia., Wall Lake	Apr.	1..	Straightening and deepening river and draining swamp.....	Seth Dean, Eng., Glenwood.
Mich., Macon	Apr.	1..	Constructing branch of Macon drain.....	D. S. Sullivan, Co. Drain Comr.
Wis., Sheboygan Falls	Apr.	1..	Constructing 2 miles 8 to 15-in. sewer in eight streets.....	F. R. Kroeger, City Clerk.
Minn., Walker	10.30 a.m., Apr.	1..	Constructing drainage ditches.....	C. D. Bacon, Co. Auditor.
Minn., Aitkin	1 p.m., Apr.	3..	Constructing county ditches.....	H. C. Beecher, Co. Auditor.
Mont., Billings	Apr.	4..	9,670 ft. 18 to 54-in. concrete and pipe sewer, cost \$66,350.....	E. M. Sneckenberger, City Engr.
Ind., South Bend	10 a.m., Apr.	4..	Constructing sewers.....	Veronica Sweeney, Clk. Board Pub. Wks.
Ind., Frankfort	2 p.m., Apr.	4..	3,160 ft. 10 to 24-in. tile sewer, cost \$6,780.....	R. H. Boynton, City Engr.
Minn., Worthington	2 p.m., Apr.	4..	Constructing drainage ditch, cost \$18,000.....	Gus Swanberg, Co. Aud.
Wis., New London	8 p.m., Apr.	4..	Sewers in several streets.....	C. J. Thompson, City Clk.
Mich., Ann Arbor	Apr.	5..	1,700 ft. 30 to 39-in. segment block sewer and 300 ft. 24-in. vitrified pipe sewer.....	Manley Osgood, City Engr.
Ind., Lafayette	Apr.	5..	18,211 ft. 15 to 36-in. vitrified segment block or reinforced concrete sewers, estimated cost \$73,819.....	E. J. Vaughan, City Clerk
Mont., Billings	Apr.	7..	Two storm sewers, 18 to 54-in.; cost, \$63,000.....	E. Sneckenberger, City Engr.
Ill., Madison	Apr.	10..	35,000 ft. tile sewers, cost \$155,000.....	W. Champion, Secy. Bd. Local Improvements.
Fla., Eustis	4 p.m., Apr.	10..	Constructing sanitary sewer system, Imhoff tanks, sludge drying bed and pneumatic ejector station; constructing storm sewer system.....	Isham Randolph & Co., Engineers, Jacksonville, Fla.
Minn., Hastings	Apr.	11..	Constructing drainage ditches.....	A. Hoffman, Co. Aud.
Ark., Rector	8 p.m., Apr.	11..	6 miles 8 to 12-in. sewers, 79 manholes, 29 flush tanks and settling tank.....	F. L. Wilcox, Engr., Syndicate Trust Bldg., St. Louis
S. C., Charleston	6 p.m., Apr.	14..	Furnishing 8 to 14-in. terra cotta pipe for 1916.....	J. H. Dingle, City Engr.
Wis., New London	8 p.m., Apr.	15..	Sanitary sewers in several streets.....	C. J. Thompson, City Clerk.
Pa., Hazleton	Apr.	15..	2,800 ft. 24 to 54-in. sewers, cost \$22,000.....	B. E. Youngman, City Engr.
Argentina, Buenos Aires	Apr.	24..	Furnishing machinery.....	Dept. Obras Sanitarias de La Nacion.
Tex., Amarillo	May	1..	Sewer system and disposal plant; cost \$10,000.....	M. H. Hardin, City Engineer.
Minn., Anoka	May	1..	Sewer construction, cost \$55,000.....	City Clerk.
N. J., Lyndhurst	May	20..	Constructing sewers; cost \$200,000.....	Bowe & Wessells, Engineers, Rutherford.

WATER SUPPLY

Wis., Oshkosh	2 p.m., Mar. 25	Repairing boilers at pumping station	Bd. of Pub. Works.
Ill., Chicago	11 a.m., Mar. 25	Electrical equipment and pumps	W. R. Moorhouse, Comr. Pub. Works
Mass., Boston	Noon, Mar. 27	140 tons 8 and 12-in. c. i. pipe	D. F. Doherty, Supt. of Supplies.
Miss., Pontotoc	Mar. 27	Pipe and waterworks plant	A. W. Kearly, Pres. Pontotoc Waterworks Co.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Minn.	St. Paul	10.30 a.m., Mar. 27	Two motor driven pumps, 5,000 gals. per min. capacity.	Aug. Hohenstein, Pur. Agent.
Fla.	Lakeland	Mar. 27	Building water reservoir for water and electric power station	City Clerk.
O.	Euclid	Noon, Mar. 27	Constructing 10-in. water main	H. S. Dunlop, Village Clk.
N. C.	Wilson	Mar. 27	3,000,000 gal. filter plant, 1,000,000 gal. reservoir, remodeling building and improving waterworks	E. F. Killelte, Mayor.
Minn.	Willmar	8 p.m., Mar. 27	4,000 ft. 4-in. c. i. water mains, etc.	Hans Gunderson, City Clerk.
Wis.	Shawano	7.30 p.m., Mar. 28	Constructing dam, flumes, power house, etc.	Electric Light & Waterwks. Com.
Okla.	Henryetta	7 p.m., Mar. 28	5 1/2 miles flow line, intake house and 1,000,000 gal. rapid sand filter	F. A. Berman, City Engr.
Wis.	Kohler	8 p.m., Mar. 28	1,000 ft. 6-in. water mains	Walter Roder, Village Clerk.
Mo.	St. Louis	Noon, Mar. 29	Furnishing and laying c. i. pipe and fittings	Edgar Friedlander, Dir. Public Safety.
Ill.	Elmhurst	7.30 p.m., Mar. 29	Pumping station, concrete reservoir and 90,000-gal. elevated steel tanks	H. L. Emerson, Chamber of Com. Bldg., Chicago, Ill.
Md.	Baltimore	11 a.m., Mar. 29	Furnishing valve and meter box castings, vitrified pipe, and concrete pipe and rings	Walter E. Lee, Water Engr.
Fla.	Ocala	Mar. 30	Constructing electric light and power plant and water system	H. C. Sistrunk, City Clerk.
N. J.	Atlantic City	Mar. 30	17,500 ft. 8 to 20-in. c-i. pipe line and setting 100 hydrants; driving 15,000 ft. of piles	Harry Bacharach, Dir. of Parks
D. C.	Washington	Mar. 31	Steel and cast iron pipe	General Purchasing Agent, Panama Canal
Ont.	St. Marys	Mar. 31	Furnishing 2,000,000-gal. pump	H. M. Miller, Supt. of W. Wks.
Sask.	Moose Jaw	noon, Apr. 1	Excavating reservoir	T. C. MacNabb, Div. Engr., C. P. R.
Ala.	Cullman	Apr. 1	Laying 2 miles of 6-in. water mains; cost \$12,000	A. G. Coe, City Clerk.
Ind.	Versailles	1 p.m., Apr. 1	Gravity waterworks system	O. C. Bushing, Town Clerk.
S. D.	Beresford	6 p.m., Apr. 3	Air compressor and power pump	Frank Bruehler, City Aud.
Pa.	Norristown	3 p.m., Apr. 3	Concrete surfacing of reservoir	W. W. Hibbert, Engr., Hale Bldg., Philadelphia.
N. D.	Langdon	2 p.m., Apr. 3	Drilling and casing 6-in. well	Ole J. Eide, County Auditor.
Ill.	Utica	8 p.m., Apr. 4	60,000 gal. elevated steel tank	L. N. Sabo, City Clerk.
Md.	Indian Head	Apr. 8	High pressure system at Naval Proving Grounds	Bureau of Yards and Docks, Navy Dept., Wash., D. C.
O.	Euclid	Noon, Apr. 10	Constructing 6 and 8-in. water mains	F. A. Pease Engineering Co., Marshall Bldg.
Va.	S. Boston	Apr. 10	Filter plant building, coagulating basin, pumping station, etc.	Anderson & Christie, Engrs., Charlotte, N. C.
Ia.	Fort Dodge	Apr. 10	Sinking well	W. L. Tang, City Clerk.
Ark.	Rector	8 p.m., Apr. 11	5 miles 4 to 8-in. c-i. pipe line, pumping station, valves, tower, tank and hydrants	F. L. Wilcox, Engr., Syndicate Trust Bldg., So. L. Mo.
S. C.	Charleston	6 a.m., Apr. 14	Furnishing iron pipe and castings for 1916	J. H. Dingle, City Engr.
Minn.	Gemmill	2 p.m., Apr. 15	Drilling a deep well	Bd. of Education, Dist. No. 2
Ala.	Florence	Apr. 15	Constructing filtration plant and pumps	C. E. Jordan, Comr. Pub. Prop.
MISCELLANEOUS				
Pa.	Harrisburg	noon, Mar. 27	Street sweeper, street sprinkler and 2-ton motor truck	W. H. Lynch, Supt. of Sts.
Ind.	Indianapolis	10 a.m., Mar. 27	6-cylinder automobile for road commissioner	L. K. Fesler, Co. Aud.
N. Y.	Albany	2 p.m., Mar. 28	Motor vehicle number plates and chauffeurs badges	F. M. Hugo, Sec. of State.
Ont.	Ottawa	4 p.m., Mar. 28	Two motor-driven flushers	F. C. Askwith, Acting City Engr.
N. Y.	Brooklyn	11 a.m., Mar. 29	11,100 cu. yds. crushed trap and screenings	L. H. Pounds, Boro. President.
N. Y.	New York	3 p.m., Mar. 30	One power sprayer	Cabot Ward, Pres. Park Commissioners.
N. J.	Newark	4 p.m., Mar. 30	20 motor cycles	Bd. of Police Comrs.
Wis.	Madison	Mar. 31	Two refuse disposal plants	H. C. Buser, City Clerk
N. Y.	New York	2 p.m., Mar. 31	5-ton motor truck with body	William Williams, Comr. W. S. G. & E.
Cal.	San Diego	11 a.m., Mar. 31	Furnishing portland cement, sand and crushed stone	U. S. Engineer's Office, Los Angeles.
Texas	Cuero	4 p.m., Apr. 3	100,000 cu. yds. dirt excavation on drainage work	Walter Reiffert, Ch. Comn.
Miss.	Clarksdale	Apr. 4	12-ton garbage inclinerator	M. W. Purnell, City Clerk.
D. C.	Washington	2 p.m., Apr. 6	Quarrying and crushing trap rock	Purchasing Officer, District Bldg.
D. C.	Washington	3 p.m., Apr. 6	Constructing postoffice at Elkins, W. Va.	J. A. Wetmore, Acting Superv. Architect.
Ky.	Louisville	Apr. 15	Portland cement	U. S. Engineer's Office

STREETS AND ROADS

Bisbee, Ariz.—Resident of Bisbee reported to board that he and a number of other men in vicinity of his ranch in Sulphur Springs Valley desired new outlet to Bisbee. They are willing, he said, to grub roots and stumps out of proposed road, along section lines if county will grade it. Supervisors, after brief consideration, accepted proposition.

Miami, Ariz.—Commerce truck won out in competition for county contract for machine for road department. All bids were rejected and it was decided to purchase Commerce at price of \$1,065.

Fairfield, Cal.—Voters of Fairfield, Solano County, ratified bond issue of \$48,500 for improvement of streets of that city.

Sacramento, Cal.—Council has adopted resolution of intention to improve Madrone Ave. by guttering, curbing and constructing sidewalks.

Sacramento, Cal.—State Highway Commission will join forces with officials of Calaveras County in putting into fine condition highway lateral from San Joaquin County line to San Andreas at cost of \$20,000.

San Diego, Cal.—Board of Supervisors

have passed resolution instructing District Attorney Spencer M. Marsh to prepare ordinance calling for a bond election for reconstructing roads and bridges and paving roads throughout county. Tentative figures of amount necessary for improvements were submitted, highest sum suggested being \$2,040,400. This was decreased by \$150,000, making lowest figure suggested for making of necessary improvements \$1,890,400. In original figures suggestions were for \$600,000 for repairing and rebuilding roads, \$300,000 for concrete bridges and culverts and \$1,400,040 for about 164 miles of concrete roads. Resolution also passed instructing County Surveyor Butler to prepare and submit figures of cost of proposed road and bridge improvements at once. County surveyor is to be assisted in preparing estimates by an engineer to be selected by advisory committee of good roads convention. It was asked that figures be given of the cost of steel, concrete and bridges of reinforced pile type.

Santa Ana, Cal.—City contemplates extensive paving program this season.

Stockton, Cal.—Petition signed by about 150 property owners of all sections of city has been filed with Council. Petition asks for opening of East

St. throughout its full length and construction of bridge over Mormon channel at East St. Signers also desire to have East St. canal entirely filled in. Commissioner O'Keefe will take matter under consideration.

Stamford, Conn.—At recent meeting of street committee of Common Council, in conjunction with Mayor, Corporation Counsel and City Engineer, it was planned to have estimates prepared for cost of paving of five streets, or sections of streets in city, with new sidewalk grades and street lines where necessary. Streets which the meeting agreed should be paved immediately are: Bond St., Pacific St., from Manhattan St. to the corner of Ludlow St.; Manhattan St., Broad St. from Atlantic St. west to the Rippowam River, and part of Glenbrook road. Street committee estimates total cost will be about \$31,000.

Dover, Del.—Kent County Levy Court has authorized \$45,000 bond issue, proceeds of which are to be used in repairing and improving the various roads throughout country. Work upon the roads will begin as soon as weather permits.

Dover, Del.—Kent County Levy Court Mar. 14 authorized issuance of \$20,000 additional good roads bonds for improve-

ment of county roads during this year.

Wilmington, Del.—Members of council Mar. 10 conferred with George W. Sparks, president of street and sewer department, relative to paving of Market St. and it was decided to have street and sewer department prepare estimates of work. One will be for paving from Market St. bridge to 11th St. and another estimate will be for paving the street from Christiana River to Brandywine Creek. Council will consider project on receipt of estimates.

Tampa, Fla.—Board of public works, pleased with appearance of streets on which concrete curbing has been laid, has decided to lay an additional 50,000 lin. ft. of that style of curbing and is asking for bids.

Canton, Ill.—Petition asking for vote on proposition to levy six-mill tax for extension and improvement of Canton Township's hard road system was formally filed with Town Clerk W. B. Cain by Commissioner of Highways Albert Hale.

Edwardsville, Ill.—It is planned to open a street bridge down to Wabash depot from south end of overhead and to pave new street with concrete. There will be sewer on Main St. only. Estimate of engineer for this work is about \$33,000.

Edwardsville, Ill.—Draft of ordinance which was presented to council providing for Randle St. improvement will provide for brick pavement of Randle St. from Wabash tracks to Elm, and for paving of all streets between Randle and St. Louis Sts. with macadam. System of sewers for the principal streets in district is proposed. Estimated cost is about \$23,600.

Cambridge City, Ind.—More than 700 voters have signed petitions for improving National Rd. through Jackson township.

Huntington, Ind.—Men from Jackson township and Roanoke interested in construction of Henry Kress Rd. appeared before Board of County Commissioners Mar. 9. Some of the men objected to provision in Viewer report recommending that first half-mile be constructed of concrete, but withdrew part of their objections when they found extra cost would not be much more than \$2,500, if it was that much. Kress Rd. matter was held over at February term until Commissioners were assured that end of the road in Roanoke was on street that had been improved.

Indianapolis, Ind.—An improvement of the Allisonville road so as to eliminate the crossing of the Lake Erie & Western railroad tracks and also two sharp turns in the highway is asked in a petition filed with the Marion County Commissioners.

Lebanon, Ind.—Following bids were received Feb. 23 for 5,580 sq. yds. of brick road with 6-in. concrete foundation, earth excavation: John Adams, local, at \$1.65 complete; Pat Shahan & Son, local, at \$1.57 complete; Geo. T. Miller, local, at \$1.52 complete. Walter Whitecotton is City Engineer.

North Vernon, Ind.—Plans have been prepared by City Engineer Charles W. Miles, for laying of 7,684 sq. yds. of pavement on streets of central part of city. Excavation will be 3,030 cu. yds. Curb required, 1,873 lin. ft.

Muncie, Ind.—Petitions for improvement of four gravel roads in Mt. Pleasant Township were filed with county auditor Mar. 13.

Richmond, Ind.—At meeting of board of public works Mar. 13 confirmation was given resolution for cement curbs and gutters on South 13th St. from E to H St. Confirmation was also given resolutions for 6-ft. cement walks on the north side of North D St. from 8th to 9th St., and a cement roadway in the alley between North 9th and 10th from C to D Sts. Petition was adopted for opening of an alley between South 21st and 22d Sts. from South A St. south to north line of Tract 537. Resolution was adopted for cement roadway in alley between South 8th and 9th Sts. from F to H Sts.

Richmond, Ind.—Petition signed by 700 property owners and voters will be submitted to county auditor asking for cement-concrete construction of National highway in Jackson Township. Road will be eight miles long and will cost approximately \$80,000.

South Bend, Ind.—Board of public works has accepted petitions for paving Leer St. Will take action in about 60 days.

Vincennes, Ind.—Following bids were received Mar. 13th for 20,000 sq. yds. asphalt paving on 5-in. concrete base, ex-

cavation included in price per sq. yd.: Premier Construction Co., Vincennes, at \$1.79, total \$43,807; Western Construction Co., Vincennes, at \$1.82, total \$44,511; Foulkes Construction Co., Terre Haute, Ind., at \$1.84, total \$44,724. Total prices include curb and gutter.

Washington, Ind.—City Council has adopted resolution calling for improvement of Main St. from West Sixth to East Second St. with brick. Council is considering adoption of resolution which will order construction of \$75,000 worth of concrete sidewalks.

Sioux City, Ia.—Following bids were received Mar. 15 for 20,000 sq. yds. concrete pavement, 6-in. one course, no vein for cement, no metal joints, no excavation except thickness of pavement: Hansen & Son, local, at \$1.26; Overson & Co., local, at \$1.28; Flinn Paving Co., local, at \$1.30; Jensen & Krage, local, at \$1.35. T. H. Johnson is City Engineer.

Webster City, Ia.—Just as soon as frost is out of the ground Hamilton County board of supervisors will begin graveling of Hawkeye Highway through this county. Highway, which follows route of the Illinois Central through Hamilton County, was all graded and drained by county last year so that no preliminary work will be necessary in graveling it. For this improvement board has appropriated \$43,000.

Atchison, Kans.—Following bids were received March 6 for 6,500 sq. yds. concrete paving: W. F. Edgell, Leavenworth, Kans., at \$1.16, total \$5,483.80; Universal Concrete Co., St. Joseph, Mo., at \$1.1975, total \$5,541.81; J. J. Williams, Kansas City, Mo., at \$1.14, total \$5,386.40; Thos. Beattie, Atchison, at \$1.19, total \$5,552.50. F. S. Altman is civil engineer.

Atchison, Kans.—Following bids were received March 6 for 7,500 sq. yds. brick paving: Land Construction Co., St. Joseph, Mo., at \$1.43 per sq. yd., total \$13,500; E. W. Geiger Construction Co., Leavenworth, Kans., at \$1.47, total \$13,752; Olson Schmidt Construction Co., St. Joseph, Mo., at \$1.50, total \$13,923; J. J. Williams, Kansas City, Mo., at \$1.54, total \$14,348. F. S. Altman is engineer.

Henderson, Ky.—At special meeting of county fiscal court to consider road bond issue, court selected roads to be improved and number of miles on each, but deferred action in finally passing upon matter until Saturday, March 18, to give county good roads association time to confer with citizens over county. Distribution of rock by court in event of bond issue is voted, is equitable, it is believed, but association believes that when farmers learn that they may be able to get twice mileage on their roads if they will agree to haul rock free of cost, they will readily agree to do so, and in this manner more than 50 miles, number court agreed upon, may be constructed.

Louisville, Ky.—Many property owners on Market St. were present at meeting of board of public works when proposed improvement of that thoroughfare was considered. Estimated costs of various kinds of improvement at various widths were submitted by Samuel T. Mann, city engineer. They are as follows: East 5th to East 10th, 52-ft. roadway, vitrified brick, \$7.81 a ft.; sarco macadam, \$4.70; 40-ft. brick, \$6.77; sarco macadam \$4.70. East 10th to East 11th, 30-ft., \$6.30; sarco, \$3.90. East 11th to East 13th, 52-ft., brick, \$7.74; sarco, macadam, \$4.66; 40-ft., \$6.71. East 13th to Washington, 52-ft., brick, \$7.74; sarco, \$4.90. City engineer also submitted an estimate of cost of Portland cement street at various widths, which is as follows: East 5th to East 10th St., 52 ft., \$6.14; 40 ft., \$5.46. East 10th to East 11th, \$4.92. East 11th to East 13th, 52 ft., \$6.10; 40 ft., \$5.45. East 13th to Washington, 52 ft., \$4.99. No action was taken by board.

Louisville, Ky.—Bids opened by Board of Public Works for oiling streets. Although bids have not been figured in detail, it is said that those submitted by Kentucky Asphalt Road Co. and Southern Asphaltoline Co. will figure lowest. Board has an appropriation of \$39,000 to spend on work which will consist principally in spreading oil to keep down dust.

Paducah, Ky.—Six Kentucky counties vote on proposition of issuing road bonds within the next few months and indications are that voters in majority of the counties will vote in favor of issues. Counties voting and the amount of bonds each county will vote on are: Perry County, \$300,000; Henderson County, \$400,000, on April 20; Marion County, \$200,000; Crittenden County, \$200,000, on

May 27; Mason County, \$200,000. Greenup County has only recently issued \$200,000 bonds to construct roads and bridges.

Oakland, Me.—Town has appropriated \$3,000 for roads and bridges and \$1,000 for sidewalks.

Pittsfield, Mass.—It was voted Mar 10 to reconsider action of previous meeting recommending to City Council discontinuance of street sprinkling on parts of Church and South Church Sts. and to recommend instead that these streets be sprinkled as far westward as Hurlburt St.

Attica, Mich.—At public meeting held recently it was decided to submit to voters of township question of bonding township in amount of \$20,000 to improve roads or highways of that township. There was some opposition, but submission of question was carried.

Bay City, Mich.—Plans are being discussed for purchase of remainder of right-of way for proposed Bay City-Saginaw boulevard.

Bay City, Mich.—Proposition to purchase street flusher for city has been referred to general street committee to report on same without delay.

Brown City, Mich.—Thirteen miles of new road connecting Brown City with Imlay City are already mapped out and survey made.

Kalamazoo, Mich.—Street committee is discussing plans for extensive paving to be done this season.

Marathon, Mich.—Movement is on foot to bond township for \$20,000 for good roads.

Saginaw, Mich.—While petitions are now in hands of State Highway Commissioner as one of early steps in proposed roadway to Midland, Saginaw Board of Trade is assisting in campaign to be made for upbuilding of roadway from Saginaw, via Sheridan Ave. to Flushing, Burt and other points in Saginaw, Genesee and Shiawassee counties.

Duluth, Minn.—If 38 West First St. property owners withdraw their assessment appeals City Council will award contract Mar. 20 to Rogers & McLean on their bid of \$63,257.20 for brick pavement with sandstone curb. This is latest step taken by Council to settle West First St. paving controversy, which has been waging for last month, and indications are that this program will go through, providing property owners carry out their end of agreement.

Duluth, Minn.—Contracts for construction of 119 cement sidewalks during 1916 will be awarded at regular Council meeting Mar. 20. Measures were introduced by Commissioner Farrell Mar. 13, but as they involve more than \$1,000 each, action was postponed by Commissioners. E. F. Hillard will be awarded contract to lay all cement walks east of 12th Ave. west and on Park Point on his bid of \$11,320, and H. O. Nyhus contract to lay cement walks west of 12th Ave. west on his bid of \$5,496.50. Resolution awarding the contract for laying 59 plank sidewalks all over city will be introduced next Monday, Commissioner Farrell announced. The only bid submitted was from H. O. Nyhus. Commissioner Merritt introduced resolution awarding C. O. White & Co. contract to haul pipe during 1916 on their bid of \$2,615. Final action was postponed. Commissioner Silberstein, safety head, introduced an ordinance appropriating \$900 for dredging of 5,000 cu. yds. at the city dump lying alongside incinerator plant at 13th Ave. west and the bay front. Resolution awarding the dredging contract to Zenith Dredging Co. on its bid of 18 cts. a cu. yd. was withdrawn, commissioners agreeing to advertise for new bids. Second reading was given ordinance classifying civil service system and appropriating \$3,000 for hauling pipe during 1916 and \$2,000 for the purchase of another consignment of cast iron pipe for water and light department.

Duluth, Minn.—Bids were opened Mar. 10 by Secretary of Works Culver on laying 119 cement and 53 plank sidewalks during 1916. As soon as figures are available arrangements will be made by Commissioner Farrell to award contracts, so that construction work can begin early in spring. A. N. Nelson, E. F. Hillard and D. H. Clough submitted bids on laying of cement walks east of 12th Ave. West, while Herman Nyhus, manager for W. H. Kiltin Co., presented only proposal for laying cement walks west of 12th Ave. and all plank walks in city.

St. Cloud, Minn.—Following bids have been received for proposed paving work: Creosote Blocks in Dist. No. 1—Hanlon & Oakes—3-in. tamarack blocks, \$84,318;

3½-in. tamarack, \$89,643; 3-in. pine, \$88,278; 3½-in. pine, \$94,038. Wyndell Co.—3-in. tamarack, \$85,102; 3½-in. tamarack, \$90,502; 3-in. pine, \$88,278; 3½-in. pine, \$94,822. Russell Construction Co.—3-in. tamarack, \$85,613; 3½-in. tamarack, \$90,653; 3-in. pine, \$88,853; 3½-in. pine, \$94,823. Fielding & Shepley—3-in. tamarack, \$88,156; 3½-in. tamarack, \$93,556; 3-in. pine, \$92,956; 3½-in. pine, \$97,876. Gruber & Co.—3-in. tamarack, \$90,929.25; 3½-in. tamarack, \$96,329.25; 3-in. pine, \$94,169.25; 3½-in. pine, \$100,649.25. Bitulithic, Dist. 1.—General Construction Co.—\$77,602.50. Fielding & Shepley—\$79,516. Granite Blocks, Dist. 1.—Gruber & Co.—\$121,169.25. Bitulithic, Dist. 2.—General Construction Co.—\$38,082.50. Fielding & Shepley—\$39,128. Concrete, Dist. 2.—Russell Construction Co.—\$26,712. Wyndell Construction Co.—\$28,596. Grand Forks Construction Co.—\$29,772.50. Gruber & Co.—\$29,912.75. Henning Co.—\$31,210. Cost per yd. for various forms of paving in different districts as computed from total figures covering excavation, sand filling, moving curb and job complete is as follows: Dist. No. 1—Creosote blocks, 3-in. tamarack, \$2.35; 3½-in. tamarack, \$2.49; 3-in. pine, \$2.45; 3½-in. pine, \$2.61. Bitulithic, \$2.16; granite blocks, \$3.37. Dist. No. 2—Concrete, \$1.57, bitulithic, \$2.24.

Grenada, Miss.—At mass meeting held here initial step was taken toward getting proposal for bond issue to be used to construct Jefferson Davis Highway, running nearly north and south through the county, and also to build similar road traversing county from east to west. It was decided to get citizens of several beats to send delegates to county seat on March 18, when it is hoped that an accurate poll of wishes of the people of county may be obtained as to building both highways and amount of bond to be issued.

Meridian, Miss.—Special election will be held March 30 to vote on bond issue of \$40,000 for road improvement.

Pontotoc, Miss.—Ninety thousand dollars Fourth District bonds of Pontotoc County were offered at public sale Mar. 7. First National Bank of Pontotoc was successful bidder, acting for Mercantile Trust Company of St. Louis, and offered premium of \$3,015. Seventy-five thousand dollars bonds for Third District roads will be sold shortly and surveying and locating the roads will begin just as soon as Good Roads Commission can be appointed for that district. Contracts for grading and graveling the roads in Fourth District will be let shortly and contracts for Third District will be let as soon as surveys and estimates can be made. These contracts will include building of Lamar Highway across Pontotoc County.

Ripley, Miss.—Fourth district of Tippah County voted Mar. 3 on question of bond issue for road building and by large majority bonds carried. Fourth district has remainder under old overseer system. Soil in that district is fine for road building, as it is composed of sand and clay.

Starkville, Miss.—Mayor and Aldermen of city have appointed committee to purchase material to pave Main and Lafayette Sts. in business section of town. Contract was let some time ago and work will begin as soon the material can be placed on ground.

Jasper, Mo.—Movement is on foot for construction of four-mile stretch of road, two miles to the north and two miles to the south of this town.

Joplin, Mo.—City Commission is discussing plans for paving and grading St. Louis Ave. with asphalt macadam. J. B. Hodgdon and Chas. A. Patterson have been authorized to act as advisory committee.

Kansas City, Mo.—County Court has instructed Allen C. Southern, county highway engineer, to advertise for bids for construction of concrete roadway on 15th St. from east end of Chicago & Alton viaduct to east end of the Missouri Pacific subway, ½ mile. Bids also were asked for macadamizing Independence and Blue Tank road southeast of Independence from the end of present macadam to intersection with Sni-a-Bar road. H. C. Chiles and delegation of citizens appeared before county court to ask for macadamizing of stretch of the Little Blue and Sibley road graded last year. Court will examine the road shortly.

Monett, Mo.—Commissioners contemplate bond issue of \$60,000 for special highways.

St. Joseph, Mo.—Preparations for opening season of great activity in public improvements are being made by mem-

bers of Board of Public Works. List of ordinances was Mar. 7th passed upon by Board for paving, grading and sidewalks. Grading of Pryor Ave. from Virginia to Alabama Sts., was designated. Construction of concrete sidewalks on east side of Smith St., between Florence Rd. and Moose St., was also designated, as were concrete sidewalks on south side of Florence Rd. between 1st and Smith Sts.; on Moose St. between Smith and 2d Sts.; on Deer St. between Smith and 1st Sts.; on Buffalo between Smith and 2d Sts. Period of 15 days was allowed for selection of material for paving Mitchell Ave. from 29th to 39th Sts. Asphaltic concrete was designated. Fifteen days was also allowed for selecting material for paving 14th St. between Olive and Sacramento Sts., which has been designated for same material. Orders were sent to City Engineer to draw up ordinances for paving Edmond St. between 24th and 25th Sts. with vertical-fiber brick blocks, and for paving 28th St. from Pattee to Mary Sts. with asphaltic macadam. Asphaltic concrete was designated for paving 14th St. between Hickory and Pacific Sts. This improvement will connect two main arteries of traffic.

Norfolk, Neb.—By vote of 660 to 176 Norfolk Mar. 10 voted \$50,000 bonds for paving street intersections. This means about six miles of paving in Norfolk this summer.

Omaha, Neb.—Ed. Peterson, local, was low bidder on grading for Douglas Co., 28,000 cu. yds. excavation at 12 cts. per cu. yd. Frank Dewey is County Clerk.

Atlantic City, N. J.—At weekly meeting members of Board of City Commissioners prepared preliminary plans for expenditure of \$600,000 for improvements during next five months. Improvements include paving projects better parks at either extremity of the city, boardwalk widening and comfort stations and municipal music for visitors along the beach this summer. One of the best of the attractions added will be marine boulevard skirting inlet around newly completed playground.

Atlantic City, N. J.—Construction of an eight-mile parkway from Tennessee Ave., Atlantic City, to highway extending from Absecon to Oceanville, is planned by Atlantic City Riviera Parkway Company, incorporated here with authorized capital stock of \$100,000. Company proposes to take advantage of act of 1890, authorizing collection of tolls for use of highways. Incorporators are Joseph G. Kerney, Walter E. Stagg, Garrett P. Snyder, George H. Delevan, I. Mulford Smith, Thomas W. Smith and M. E. Rehner, all of Atlantic City.

Elizabeth, N. J.—Road committee of Board of Freeholders announced Mar. 15 that it had concluded to award contract for improvement of Mountain Ave., running through Fanwood Township, Mountainside and Westfield, to Sproul Construction Co., of Peekskill, N. Y., whose bid of \$79,513.55 was the lowest. It is only waiting for approval of State Road Commissioner Edwin A. Stevens before taking such action, it was stated. When bids were opened last week those of Sproul concern and Weldon Construction Co., of Rahway, whose bid of \$87,034.12 was next lowest, were held for investigation.

Fanwood, N. J.—Bids for repaving of Mountain Ave. in Fanwood County, were received Mar. 8 by County Road Committee of Union County Board of Freeholders. Contract will be awarded before the next meeting of Board. Lowest bidder was H. B. Sproul Co., with bid of \$79,513.55. It is proposed to pave thoroughfare with concrete.

Freehold, N. J.—Mayor Walling attended meeting of Board of Freeholders Mar. 8 relative to matter of having new cement road laid from Central railroad tracks south to borough limits. Estimated cost of road to be laid is about \$20,000, of which borough will pay 10 per cent.

Freehold, N. J.—Board of freeholders at special meeting here March 10 adopted resolution providing for paving of 3,000 ft. stretch of Broad St., Keyport. Resolution also provided that cost to the county should not exceed \$18,000.

Madison, N. J.—Borough will call for bids on Warren Rd., about 57,000 sq. yds., on concrete base. George W. Gardner is Engineer, Borough of Madison, and Town of Chatham.

Morristown, N. J.—Resolution by Road Committee called for preparation of specifications for Hanover-Whippany Rd. with a hearing on April 12.

Newark, N. J.—See "Sewerage."

Newton, N. J.—Sussex county board of freeholders in weekly session March 13 arranged to prepare for issuance of approximately \$28,000 in road improve-

ment bonds to cover county's share in cost of the Newton-Sparta Rd. Freeholders would give no idea as to probable life of the bonds.

New Brunswick, N. J.—Resolution has been adopted to effect that Borough Attorney Peter F. Daly prepare at once proper petitions for property owners living on different streets to sign, also ordinances and other legal documents to bring about improvements on seven principal streets of borough.

Oaklyn, N. J.—Borough Council started movement to provide better paved streets for town by passing, on first reading, ordinances for curbing and gutters along Newton, Collingwood and Beechwood Aves. and for the opening of Beetwood Ave. It is expected that work will be started as soon as weather permits.

Brooklyn, N. Y.—Borough President Lewis H. Pounds has requested Board of Estimate to issue \$1,000,000 in corporate stock for purpose of repaving 86 streets in various parts of Brooklyn during 1916. Request was referred to corporate stock budget committee of Board of Estimate, City Hall, Mar. 17. Wallabout Market will receive large portion of the funds to be expended for this work. Mr. Pounds wants to repave in the market, market square, West Ave., E, F and G Sts. Estimated cost of all this work is \$87,000. Other large items are Utica Ave. from Eastern Parkway to East New York Ave., which it is estimated will cost \$35,800; Rogers Ave. from Malbone St. to Flatbush Ave., which it is estimated will cost \$74,600; Van Brunt St., Hamilton Ave. to Van Dyke St., \$42,500; Third Ave., 60th St. to Bay Ridge Ave., \$34,700, and 79th St., Ridge Blvd. to 11th Ave., \$38,600.

East Syracuse, N. Y.—Town Supt. of Highways Thomas R. Baker and town board entered into an agreement by which Mr. Baker may use \$15 per mile for general repair work, with fixed amount of \$1,185 for repairing of town roads. Other articles in agreement call for \$1,000 for general stone repair work; \$400 for sluiceways; \$3,000 for gravel construction on Walsh Rd., west of county road; \$3,000 for stone construction on Orville-Jamesville Highway and balance, \$2,468.19, of the \$11,053.19 raised, be placed in reserve fund.

Gouverneur, N. Y.—Appropriations for work to be done on highways of town as made by Town Board are as follows: \$1,500 for construction of crushed stone road from George Whitmore farm to town line of Gouverneur and Dekalb, distance of two miles on Rock Island road; \$800 for crushed stone road from G. H. Overacker farm to Frank Lavack farm, about one mile, from Gouverneur and Dekalb town line to Elmdale; \$400 for crushed stone road from G. H. Overacker farm to Streeter farm, about three-fourths of a mile, from Cream of Valley road to the Gouverneur and Macomb town line; \$1,200 for crushed stone road from George Parsons' farm to Gouverneur and Rossie town line, about one and one-half miles from Gouverneur village to the Gouverneur and Rossie town line; \$1,872 for general work on 117 miles of highways in town; \$500 for repair and construction of culverts and sluices; \$1,478 for reserve fund.

Hudson, N. Y.—County has voted to raise bonds in sum of \$113,000 for constructing roads.

Poughkeepsie, N. Y.—City has decided to try out wooden blocks for street paving. Public works department has recommended to Common Council that five of city's streets be improved in this manner.

Schenectady, N. Y.—City will purchase one motor truck to haul street sweepings to city dump and may "motorize" one of its flushers. In event lower cost can be shown, warranting further investment, additional motor-driven apparatus will be purchased next year.

Syracuse, N. Y.—Ordinance will be submitted for consideration of Common Council proposing extension of Lakeview Ave. to Hiawatha Ave. as an entrance to new State Fair Blvd. to be built by State. This is in accordance with plans agreed upon at time State consented to improve driveway as county highway.

Watertown, N. Y.—Following bids were received Mar. 17 for 9,500 sq. yds. paving with wood block on 8-in. concrete base, 4,000 cu. yds. excavation: A. F. McConville, Ogdensburg, N. Y., at \$27 per sq. yd., total \$25,174; Warren Bros. Co., Boston, Mass., at \$3.38, total \$29,216; Morrison & Quinn, Rochester, N. Y., at \$3.48, total \$30,208; Franklin Contracting Co., New York, at \$3.40, total \$29,465. Prices include all excavation. E. W. Sayles is City Engineer.

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Asheville, N. C.—Commissioners of Buncombe County took two important steps for betterment of roads in this county March 8, when they decided to start work at once on road to Ridgecrest and appropriated \$30,000 for improvements of roads in West Asheville. Commissioners had promised to give Black Mountain district definite statement in regard to kind of road to be built to Ridgecrest, and committee from that district appeared before commission March 8. Committee was informed that work would be started practically at once, that road would be constructed of an 8-in. macadam base, surfaced with asphalt. Stretch of road to be built is 18 miles in length, and road is to be 18 ft. wide. It will cost between \$75,000 and \$100,000, according to estimates.

Lima, O.—See "Water Supply."

Lima, O.—Council has adopted resolutions for improvement of several streets by paving.

Massillon, O.—City contemplates calling vote at April election on question of bond issue for improvement of streets and sewers.

Salem, O.—Council has approved resolution ordering improvement of East 7th St. by grading and paving.

St. Marys, O.—Petitions seeking to pave with concrete the St. Marys-Celina road have been filed by citizens of two places with County Commissioners and State Highway Commission. Approximate cost of improvement is \$115,000.

Urbana, O.—City has voted in favor of bond issue in sum of \$8,000 for purpose of improving streets. Emmet F. Sweetman is City Civil Engineer.

Urbana, O.—City has voted in favor of bond issue in sum of \$10,000 for purpose of improving Miami street by paving and constructing necessary curbs.

Eugene, Ore.—Petitions asking for special election in Lane County for purpose of bonding county for sum of \$700,000 to build hard-surfaced road from Cottage Grove, near southern boundary of the county to northern boundary, between Junction and Monroe, are in circulation.

Portland, Ore.—Another slash was made in prices for paving in bids received by Council recently for improvement of Sandy Blvd. from East 72d to East 82d Sts. Oregon Independent Paving Co. bid \$1.20 a sq. yd. for standard bitulithic and 95 cts. a sq. yd. for bitulithic redress. Total of the bid of this company was \$8,769. Next highest bid was that of Oskar Huber, who quoted a price of \$1.20 a sq. yd. for bitulithic and 97 cts. a sq. yd. for bitulithic redress. Total of Huber's bid was \$9,234.

Salem, Ore.—Proposal of war department to establish military and post road from St. Louis, Mo., to Olympia, Wash., was made known here to-day in letter to Secretary of State Olcott from office of district engineer of department in Yellowstone Park. Proposed highway is to be known as Pioneer Way, and will follow generally old Oregon trail. Letter to Mr. Olcott asks for information concerning Oregon roads and for road maps.

Umatilla, Ore.—Umatilla County voters will vote on \$1,000,000 bond issue for hard surface roads in May and indications are that issue will carry as first road that will be paved, if election is successful is from Pendleton to Umatilla.

Vale, Ore.—Building of new road to tap potash deposits through this county will probably be started later in spring, as result of an interview held between County Commissioners and potassium boosters. Necessity of a water grade along Jordan Creek will enter also into County Court's calculations. Presentation of publication of boundary lines for proposed irrigation district will be made to County Court on April 5. It is announced.

Erie, Pa.—Opening of several streets in eastern part of city to relieve unsatisfactory conditions existing, was urged by bureau of engineering in a communication to William D. Kinney, director of streets and public improvements March 11.

Erie, Pa.—Three bond issues, totalling nearly a million and a half dollars, will be put before voters of Erie May 16. One million dollars are to be provided for improvements to Mill Creek; \$225,000 will be set aside for first step in elimination of grade crossings; \$200,000 will be used for improving both branches of Garrison run. City will obtain in benefits assessed along Mill Creek, a considerable portion of cost of work. If million dollar issue passes and that for railroad crossings elimination fails, elim-

ination of crossings will be put off indefinitely.

Johansstown, Pa.—Suppes Contracting Co. is thinking of buying concrete mixer.

South Bethlehem, Pa.—Solicitor has been instructed to prepare ordinances providing for increase in borough indebtedness of \$150,000 for permanent street improvement and \$25,000 for fire apparatus and equipment.

Uniontown, Pa.—March grand jury has approved petition of Fayette County Commissioners calling for bond issue of \$400,000. Money will be used for county road improvements, it being plan of the Commissioners to build 18 miles of improved highways.

Williamsport, Pa.—A petition to the City Commission to extend paving operations in Newberry this summer is being circulated. The petition asks that in connection with the paving of Arch St. between Third and Fourth Sts. the improvement be extended to include Erie Ave., Dewey Ave., Water St. and that portion of Arch St. north of the end of the proposed pavement.

Westerly, R. I.—City is in market for trap rock for road construction.

Knoxville, Tenn.—An appropriation of \$10,000 for maintenance and repair of roads was authorized by Knox county road commission at meeting held March 8.

Beaumont, Tex.—County Surveyor George W. White will have full charge of building of new highways with \$202,164 derived from \$190,000 road bond issue. At meeting of Commissioners Mar. 13, Mr. White was appointed road engineer. In addition to overseeing the building of new highways to be constructed out of bond money, Mr. White will also have charge of repair work. In fact, he will be in full charge of road work, having jurisdiction over selection of materials, preparations of plans and specifications, making of field measurements and notes, designation of where bridges and culverts are to be built and their length, and inspection and checking of work.

Corsicana, Tex.—Special election will be held shortly to vote on bond issue of \$150,000 to build good roads.

Dallas, Tex.—Paving of Oak Lawn Ave. from Lemmon to Maple was asked Mar. 14 by large number of property owners in petition filed with Board of City Commissioners. Bitulithic is material desired.

Gilmer, Tex.—Petitions for an election for \$300,000 bond issue for good roads are being circulated throughout Road District No. 2 this week, which com-

poses about one-half of the county, and will be presented to the Commissioners' Court soon.

Salt Lake City, Utah.—East 11th St. is to be paved with asphalt.

Salt Lake City, Utah.—As result of meeting recently of joint committee appointed to devise ways and means of protecting city water supply from contamination in Big Cottonwood canyon, proposition will be submitted to Commission to have city appropriate \$10,000 to add to \$20,000 to be raised by county and mining companies to widen road in lower canyon. Commissioner Heber M. Wells, chairman of joint city and county commission on Cottonwood matter, and Commissioner W. H. Shearman of water works department promised to take appropriation matter up with city as soon as possible.

Norfolk, Va.—At meeting Mar. 14 Aldermen voted to allow use of Durax on Granby St. by Virginia Railway & Power Co.

Norfolk, Va.—Board contemplates appropriation of \$27,000 for construction of concrete roads.

Lind, Wash.—Plans and specifications have been approved by state highway commissioner, Olympia, for grading, bridging and surfacing with gravel of 12.5 miles of permanent highway between Lind and Ralston, in Adams county, Washington. Estimated cost is \$54,165. F. R. Hewett is construction engineer, Ritzville.

Spokane, Wash.—Ordinance calling for paving of Grand Blvd. from 29th Ave. to 43d Ave., from 43d Ave. to Scott St., from Scott St. to city limits, to connect with Palouse highway, was introduced in the City Council Mar. 6 and Mar. 27 was set as date for the hearing on its final passage.

Spokane, Wash.—Board of county commissioners have received petition signed by majority of the property owners along proposed route, for establishment of permanent highway connecting Meadow Lake with Medical Lake, going distance of several miles east from Normal permanent highway to Medical Lake.

CONTRACTS AWARDED.

Phoenix, Ariz.—City commission has decided that South Central Ave., from Harrison St., to Yavapai, will be paved with Tarvia asphalt filled macadam. Contract has been awarded to California-Arizona Construction Co., at following bid: 11,225 sq. yds., Paving Specification No. 35, \$1.24 per sq. yd.; 5,353 lin. ft. com-

Monticello, Iowa.—Following bids were received March 16 for paving:

Bidder No.	Paving per sq. yd. (13,100)	Comb. curb and gutter per lin. ft. (7,850)	Curb (relined) per lin. ft. (600)	Curb bars per lin. ft. (450)	Alley X-ing per sq. yd. (340)	Walk repaired per sq. ft. (1,000)	Excess grading per cu. yd. (3,200)	Excess conc. per cu. yd. (5)	10-in. vit. C. B. pipe per lin. ft. (60)	X-ing plate per lb. (4,000)	Total
1 (a)...	\$1.85	\$0.68	\$0.10	\$0.15	\$1.35	\$0.12	\$0.35	\$8.00	\$0.40	\$0.04	\$31,623.50
2 (a)...	1.87	.73	.27	.18	1.87	.14	.55	7.00	.90	.05	33,295.30
3 (a)...	2.00	.68	.10	.22	1.55	.14	.48	6.00	.55	.03%	34,109.66
4 (a)...	1.76	.65	.20	.15	1.25	.15	.40	6.00	.75	.03	30,396.00*
5 (a)...	1.98	.60	.05	.25	1.25	.12	.50	9.00	.25	.04	32,730.50
7 (a)...	2.05	.75	.20	.25	1.50	.13	.50	10.00	.75	.05	33,510.00
1 (b)...	1.93	.68	.10	.15	1.35	.12	.35	8.00	.40	.04	32,671.50
2 (b)...	2.06	.73	.27	.18	2.06	.14	.55	7.00	.90	.05	35,848.90
3 (b)...	2.12	.68	.10	.22	1.55	.135	.48	6.00	.55	.03%	35,676.66
4 (b)...	1.96	.65	.20	.15	1.25	.15	.40	6.00	.75	.03	33,016.00
5 (b)...	2.12	.60	.05	.25	1.25	.12	.50	9.00	.25	.04	34,465.50
6 (b)...	1.91	.70	.15	.17	1.12	.15	.35	5.50	.60	.035	32,536.80
7 (b)...	2.25	.75	.20	.25	1.50	.13	.50	10.00	.75	.05	38,130.00
1 (c)...	1.72	.48	.10	.15	1.35	.12	.35	8.00	.40	.04	30,758.50
2 (c)...	1.59	.43	.27	.18	1.63	.14	.55	7.00	.90	.05	29,416.70
3 (c)...	1.57	.39	.10	.22	1.60	.14	.50	6.00	.55	.03%	28,479.16
4 (c)...	1.48	.46	.20	.15	1.25	.15	.40	6.00	.75	.03	27,308.50
5 (c)...	1.44	.35	.05	.25	1.25	.12	.50	9.00	.25	.04	25,710.00
7 (c)...	1.80	.40	.20	.25	1.50	.13	.50	10.00	.75	.05	32,012.50
2 (d)...	1.71	.73	.27	.18	1.71	.14	.55	7.00	.90	.05	31,144.90
4 (d)...	1.60	.65	.20	.15	1.25	.15	.40	6.00	.75	.03	28,300.00
5 (d)...	1.80	.60	.05	.25	1.25	.12	.50	9.00	.25	.04	30,372.50
7 (d)...	1.80	.75	.20	.25	1.50	.13	.50	10.00	.75	.05	32,235.00
4 (e)...	1.65	.65	.20	.15	1.25	.15	.40	6.00	.75	.03	28,955.00
5 (e)...	1.85	.60	.05	.25	1.25	.12	.50	9.00	.25	.04	31,027.50
7 (e)...	1.80	.75	.20	.25	1.50	.13	.50	10.00	.75	.05	32,235.00

*Awarded.

Bidders were as follows: 1, C. B. McNamara & Co., Dubuque; 2, Dearborn Const. Co., Cedar Rapids; 3, J. J. Leonard, Dubuque; 4, F. K. Hahn, Cedar Rapids; 5, Hydraulic Const. Co., Davenport; 6, Korneman & Smith, Muscatine; 7, Thos. Carey & Sons, Clinton. Kinds of pavement bid on were as follows: (a) Vertical fibre brick plan; (b) vitrified block plan; (c) reinforced concrete plan; (d) asphaltic concrete plan, class "A" manufactured asphalt; (e) asphaltic concrete plan, class "B" natural lake asphalt. J. G. Thorne, Clinton, Iowa, is consulting engineer. J. R. Thorne, Clinton, Iowa, is consulting engineer.

bination curb and gutter, \$0.92 per lin. ft.; 492 lin. ft. curb only, \$0.50 per lin. ft.; 764 lin. ft. Valley gutter, \$0.90 per lin. ft.; 25 lin. ft. 10-in. concrete pipe, \$0.75 per lin. ft.; 593 lin. ft. 12-in. concrete pipe, \$0.80 per lin. ft.; 22 lin. ft. 15-in. concrete pipe, \$1.25 per lin. ft.; 40 lin. ft. 18-in. concrete pipe, \$1.40 per lin. ft.; 58 lin. ft. 24-in. concrete pipe, \$2.00 per lin. ft.; 386 lin. ft. 12-in. corrugated iron pipe, \$1.25 per lin. ft.; 88 lin. ft. 18-in. corrugated iron pipe, \$2.00 per lin. ft.; 38 lin. ft. 24-in. corrugated iron pipe, \$3.00 per lin. ft.; 74 lin. ft. 30-in. corrugated iron pipe, \$4.00 per lin. ft.; 13 standpipes, detail N, \$9.00 each; 1 standpipe, detail M, \$17.00 each; 26 12-in. gal. iron gates, \$1.50 each; 3 18-in. gal. iron gates, \$2.25 each; 2 24-in. gal. iron gates, \$3.50 each; 9 Only gutter inlets double, detail O, \$25.00 each; 2 Only gutter inlets double, detail J, \$44.00 each; 6 Only storm water manholes, \$150.00 each; extra work, \$200.00.

San Rafael, Cal.—Marin county supervisors have let contracts for Bolinas and Willow Camp roads, to cost \$16,000. Of this amount \$4,000 will be spent in widening, straightening and reducing grade of Bolinas road between Fairfax and summit of the Bolinas ridge, and \$12,000 will be used in building connecting road between Willow Camp and Bolinas.

Bradford, Ill.—Contract has been let to John Anderson, Lee Center, Ill., for two miles of hard road.

Chicago Heights, Ill.—Board of Local Improvements Mar. 8 opened bids for paving East End Ave. with brick, from 16th to 22d Sts. Contract was awarded to Chicago Heights Coal Co. for \$29,927.66. Fletcher & Co. of Blue Island bid \$31,780.35. The bid of Russell & Co. was withdrawn. This is lowest price ever received for brick paving.

Allen, Ind.—Contracts for double track macadam roads have been awarded as follows: To Ellison & Co., Monroeville, Ind., at \$9,362, for Row Rd.; to A. H. Fry, Bluffton, Ind., at \$10,200, for Youse Rd.

Bluffton, Ind.—Wells County commissioners have awarded contracts for 12 roads and streets. D. O. North, of this city, got two Bluffton street contracts for \$22,950 and \$7,982 respectively. Other contracts were as follows: A. G. Brumfield, of Marion, Gibson Rd. for \$7,535, Glass Rd. for \$5,350 and Hetrick Rd. for \$3,725; McAfee & Lantis, Bauernmeister Rd. for \$4,637; C. W. Marshall, Dustman Rd. for \$4,045; F. B. Fishbaugh, E. McAfee Rd. for \$11,644 and John Kimmer Rd. for \$2,254; and O. L. Lancaster Rd. for \$12,633; Charles Marshall, Dustman Rd. for \$4,045; Fulton & Jackson, the Shoup Rd. for \$3,895, and Charles Kepplinger, G. W. Farrell Rd. for \$7,364.

Brazil, Ind.—J. H. McGuire & Son, contractors of this city, were awarded contract for construction of stone road in Fountain County near Covington. Contract price was \$15,000.

Fort Wayne, Ind.—County Commissioners Mar. 14 let contracts for two Allen County roads. First was for Row road in Monroe Township. Road is to be stoned for 11,400 ft. by Ellison & Co. for \$9,362. Engineer's estimate for the job was \$10,850.02. Other contract is for Youse road in Madison Township. Road will be stoned for 10,682 ft. by A. H. Fry for \$10,200. Estimate was \$11,590.85.

Franklin, Ind.—Following contracts have been awarded for gravel roads in Johnson County: to Edward Barnett, Bargererville, Ind., at \$7,575, and to D. A. Brewer, Franklin, Ind., at \$12,150. John C. Gregg is Auditor.

Greenfield, Ind.—Board of county commissioners has awarded contract for J. R. Adams Rd. to George Hoppes for \$9,444, and for William Offenbacher Rd. to T. P. Leary for \$11,749. Petition for paving National Rd., east and west of this city, was withdrawn.

Indianapolis, Ind.—Three contracts for road work have been let by Marion county commissioners. McKensy & Jenkins, of Frankfort, received contract for Thompson macadam road, extending north for a distance of two and a half miles from Southport. Their bid of \$17,750 was lowest of the eight bids submitted to commissioners. The R. E. E. M. Construction Co., of Evansville, received contract for opening Raymond St. between Keystone and Bethel Aves. Road is to be improved with concrete. Bid was \$14,818. Harry Marberry, of Seymour, received contract for building concrete boulevard in Southern Ave. at south side of Garfield park. Highway is about a mile long, and is known as Yoke road. Marberry's bid was \$27,250.

Shelbyville, Ind.—Two contracts for improvements of roads were awarded by County Commissioners at their session Mar. 8, Moberly & Co. being given A. C. Howe Rd., in Noble Township, at \$5,700, and William Avery Smith Rd., in Liberty Township, at \$1,950. The St. Paul Stone Quarries Co. submitted the only other bid on Smith Rd., the figures being \$2,022.12. There were two other bids on Howe Rd., as follows: Sullivan & Sullivan, \$5,825, and William Avery, \$5,837.

Shelbyville, Ind.—Contract awarded to J. D. Adams & Co., Indianapolis, for 4 road graders.

Engle Grove, Ia.—For 27,000 sq. yds. concrete paving at \$1.43½ per sq. yd. for paving, 45 cts. per cu. yd. excavation to Jensen & Krage, Sioux City, Iowa.

Mason City, Ia.—For 47,000 sq. yards reinforced concrete pavement, to Dearborn Construction Co., Waterloo, Iowa, at \$1.63 per sq. yd. and curbing at 39 cents per lin. ft. F. P. Wilson is City Engineer, Mason City, Ia.

Topeka, Kan.—The contract for all asphalt paving this year has been let by the City Commission to Security Paving Co. of Kansas City, low bidder, at \$138,254.44. The bid of the Kaw Paving Co. of Topeka was second at \$142,676.37.

Duluth, Minn.—Commissioner Farrell, works head, announced Mar. 13 that he would recommend awarding of contract for paving of Superior St., from 16th to 23d Ave. east, to General Contracting Co. of Minneapolis on its bid of \$49,473.60. Street will be paved with asphalt and work will begin some time in April. This will be first big paving contract awarded this year. In addition E. F. Hilliard will be awarded contract to lay cement walks authorized for this year east of point of rocks and Herman Nyhus, manager of W. H. Kiltin Co., contract to lay the walks west of point of rocks. Former will also lay walks on Park Point. Mr. Hilliard and Mr. Nyhus both submitted low bids on proposed jobs, 14½ cts and 14 cts. per sq. yd., respectively.

Flora, Miss.—To Owens Construction Co., Longview, Texas, at \$80,000 for paving. Xavier A. Kramer, Magnolia, Miss., is engineer.

Pontotoc, Miss.—The Good Roads Commission of the Fourth district of Pontotoc County let the contract for 40 miles of good roads to Hicks, Miller & Hicks of Alabama, for \$45,087.50.

West Asheville, N. C.—Contract let to Noll Construction Co. of Chattanooga for 3,000 sq. yds. sheet asphalt on concrete.

Erie, Pa.—The J. & M. Doyle Co. was awarded contract for paving Raspberry St. from Fourth to Eighth St. on a bid of \$10,270.

Park City, Tenn.—For 21,000 lin. ft. concrete header pavement, to Donifon, Doughty & Taylor, Knoxville, Tenn., at 17½ cts. per lin. ft. John A. Anderson is Recorder.

Brownwood, Tex.—City council has awarded contract for construction of causeway on Baker St., which will give new and shorter outlet to Brownwood Heights. J. E. Eubanks, of this city, was awarded contract.

Terrell, Tex.—Contract for construction of 2,380 ft. of sidewalk on East Moore Ave. has been awarded to F. R. Harris for \$1,151.60.

Portsmouth, Va.—Common Council at meeting Mar. 14 awarded contract for paving several streets of city in accordance with paving program adopted several months ago with sheet asphalt on a 5-in. concrete base. There were several bidders for work and bids of Louis Lawson and F. J. McGuire for asphalt work were identical, \$1.50 per sq. yd. Contract was awarded to McGuire because of differences of several hundred dollars in bid for curbing and stone work to be done in connection with paving. Not all paving work will be done in concrete, however, as committee recommended that new type of paving in this section of country be tried out. Queen and Crawford St. approach to ferry terminals will be paved with "rockmac" at cost of \$1.35 per sq. yd., and also two blocks in Effingham St. between County and South will be paved with this new material, contract for which also goes to F. J. McGuire.

Johnson Creek, Wis.—Contract has been awarded to Lehmann Bros., Watertown, Wis., for concrete road.

Milwaukee, Wis.—Contracts have been awarded for asphalt pavement on concrete foundation as follows: To Badger Construction Co., 1015 Ry. Exch. Bldg., Milwaukee, for 8 jobs at \$107,598.92; to

White Construction Co., 1006 Ry. Exch. Bldg., Milwaukee, for 3 jobs at \$48,107.54; to T. P. Coughlin Co., 534 Stock Exch. Bldg., Chicago, at \$89,625.33.

SEWERAGE

Los Angeles, Cal.—Petitions for sewerage several streets have been presented to council.

Jacksonville, Fla.—Bill providing for letting of contracts for construction of new sewers and drains by board of bond trustees with bond money was passed March 10. Advertising for bids for material and labor will be started at once. Paving certificate measure was also passed last evening. Amount involved is \$100,000 and is to be paid in one, two, three, four and five years and bear interest at rate of 5½ per cent.

Savannah, Ga.—Tabulation of bids on drainage work to be done under city's bond issue of \$400,000, has been completed by Chief Engineer Conant. It showed that lowest bid on Division A, the East Side portion of work, was made by Obenshain Bros., of Center Mouches, N. Y., and on Division B, the West Side contract, by Gadsden Contracting Co. and Guild & Co., of Savannah, bidding jointly. Low bids on two divisions were respectively \$121,124.50 and \$132,288.70, giving total for the entire work of \$253,413.20. There were thirteen bids on Division A and eight on contract for Division B. No contract has been awarded for either branch of work. Bids on bonds will be opened on March 16, and contracts doubtless will then be awarded. Comparative bids, with brief explanatory statement, were thus announced: Total bid as enumerated below includes all work set forth in specifications. "Amounts given below are for following types of material: Vitriified clay pipe for all circular sewers of diameters between 8 and 24 inches. Sectional reinforced pipe of Lock Joint Pipe Co.'s type for all circular sewers between 30 and 60 inches in diameter, inclusive. Division A: Obenshain Bros., Center Mouches, N. Y., \$121,124.50; Sullivan, Long, Hagerty, Dysard Co., Bessemer, Ala., Atlanta, \$125,621.00; Gadsden Contracting Co. and Guild & Co., Savannah, \$127,954.00; Municipal Engineering Co., Atlanta, \$129,053.50; A. T. Twigg & Sons, Augusta, \$132,213.00; Michler & Flynn, Chattanooga, Tenn., \$139,184.50; M. O'Herron & Son, Baltimore, \$143,846.50; T. J. Shea, Los Angeles, \$152,297.00; J. B. Sheets Co., Pittsburgh, Pa., \$153,519.50; J. B. McLane, Co., Newport, Ky., \$160,865.50; Benjamin Thompson, Tampa, Fla., \$161,849.25; Carson Cons. Co., Savannah, \$182,976.50; Whiting Turner Co., Baltimore, \$204,606.50. Division B: Gadsden Contracting Co. and Guild & Co., Savannah, \$132,288.70; A. J. Twigg & Sons, Augusta, \$150,409.20; Sullivan, Long, Hagerty & Dysard Co., Bessemer, Ala., Atlanta, \$150,595.50; M. O'Herron & Son, Baltimore, \$172,000.00; Benjamin Thompson, Tampa, Fla., \$172,760.10; J. B. Sheets Co., Pittsburgh, \$176,149.00; T. J. Shea, Los Angeles, \$183,966.50; Carson Construction Co., Savannah, \$199,418.50; Lowest bidder, Division A, Obenshain Bros., Center Mouches, N. Y., \$121,124.50; Lowest bidder, Division B, Gadsden Contracting Co., Savannah, \$132,288.70. Total, \$253,413.20.

Edwardsville, Ill.—See "Streets and Roads."

Taylorville, Ill.—That Taylorville sewer soon have combination sanitary sewer and surface drainage system several miles long, draining north, west and south-western portions of city and costing about \$87,000 now seems certain. City Council Mar. 6 referred matter of this combination system back to Local Improvements with power to act. Board will meet soon and draw up ordinance to authorize measure.

Patchogue, L. I.—Movement is on foot for installation of sewer system and disposal plant.

Hagerstown, Md.—Under suspension of rules in State Senate Mar. 9, Senator Harvey S. Bomberger had Hagerstown Sewerage Bill passed by Upper Branch. Bill provides for bond issue of \$750,000 for sewerage system and disposal plant in Hagerstown and provides for naming of commission of five to carry out purposes of Act.

Fall River, Mass.—Provision is made for construction of sewer and city is authorized to expend \$500,000 for this project. Loans are also authorized amounting to \$250,000 for meeting expenditures, prior to assessment of damages.

Bad Axe, Mich.—All bids for construction of sewers have been rejected. New

proposals will be received early in April. **Berrien Springs, Mich.**—At special meeting of village council bids opened for installing of sewer system in this village. S. J. Miller of Elkhart, entered lowest bid, naming \$2,170 for a 1,200 ft. sewer. Contract will probably be awarded at the next meeting.

St. Paul, Minn.—Final order for sewer on Colne St. from Hatch to Front St. was amended to read Colne St. from Hatch St. to point 117 feet north of north line of Front St.

Anaconda, Mont.—See "Streets and Roads."

Harlowton, Mont.—See "Water Supply."

Matawan, N. J.—George A. Johnson, 150 Nassau St., New York, has been retained by Borough to prepare plans and specifications for sewerage system and sewage disposal works and to supervise construction thereof.

Newark, N. J.—Temporary loan bonds to amount of \$1,385,000 were sold Mar. 10 by Controller Farmlay at City Hall to Solomon Brothers & Hutzler of New York. This firm offered to loan sum to city at an interest rate of 2.48 per cent. Sale included \$700,000 toward city's share of Passaic Valley sewer. \$500,000 tax bonds and \$185,000 paving bonds. They will be retired at end of six months. Unsuccessful bidders were: Farson, Son & Co., 3.04; Goldman, Sachs & Co., 2.68, and Bond & Goodwin Co., 2.625.

Passaic, N. J.—Contract for sedimentation basin work in meadows, which will probably be let shortly, is the last large contract to go out. Terms call for completion July 1, 1917. By this time it is stated all other big work will be done. Lowest bidder whose figures appeared Mar. 14 was Arthur McMullen Co. of New York. Firm is said to enjoy reputation which makes it almost certain that it will win contract. It was builder of big Detroit tunnel. Bidders and bids in order of their size were as follows: McMullen Co., \$878,080; Cavanaugh Contracting Co., New York, \$816,000; Mason & Hanger Co., New York, \$843,581.37; William J. Caughlin, Jersey City, \$876,100; Wm. Eaker, Inc., \$877,247.40; Old Colony Construction Co., Boston, \$877,650; Carrington Construction Co., \$906,028; T. A. Gillespie Co., New York, \$918,276; Harrison & Craig Co., Newark, \$947,430; Dock Contractor Co., Hoboken, \$963,096.80; Booth & Flink, Ltd., Pittsburgh, \$985,950; Phoenix Construction Co., New York, \$988,260; Oscar Daniels Co., \$1,048,200; New York & New Jersey Construction Co., \$1,048,300; R. J. Collins, Jr., New York, \$1,102,500.

Plainfield, N. J.—Council will adopt ordinance for extension of sewerage system.

Spring Lake, N. J.—Petitions for extension of borough sewer system through Pennsylvania Ave. to Villa Park section will be placed in circulation soon by Councilmen Knight and Hills.

Toms River, N. J.—Meeting to discuss sewer question in Toms River was held by Dover Township Committee, and was attended by practically all voters of proposed sewer district. Matter of cost of installation and maintenance was discussed at length, outcome of meeting being a request to Township Committee that they engage competent engineer to prepare plans and specifications for sewer system. Committee will take up matter at once and will then submit it to voters at special election.

Akron, N. Y.—Town will vote at election to be held March 21 on proposition to construct sewerage system at cost of \$30,000.

Buffalo, N. Y.—Engineering Bureau is considering plans for sewage disposal in town of Amherst, town of Sloan and Sattler Driving Park property.

Syracuse, N. Y.—Ordinance adopted for 15-in. sewer in Comstock Place and Ostron Ave.

Wilson, N. C.—Committee on sewer disposal on Goldsboro St. reported and upon motion it was ordered that sewer be extended about 1,500 ft. down swamp before it enters the run.

Massillon, O.—See "Streets and Roads."

Middletown, O.—City clerk has been authorized to advertise for bids for contract of laying sewer and water mains on Superior Ave.

Salem, O.—Council has approved resolution ordering construction of sanitary sewer on Jennings Ave.

Urbana, O.—City has voted in favor of bond issue in sum of \$3,000 for purpose of constructing storm sewer in Miami St. from Glenn Ave. to Sara St. Emmet F. Sweetman is City Civil Engineer.

Urbana, O.—City has voted in favor of bond issue in sum of \$9,900 for purpose

of constructing sewers. Emmet F. Sweetman is City Civil Engineer.

Vale, Ore.—See "Streets and Roads."

Carlisle, Pa.—City is considering construction of sewers and is preparing ordinances for construction in four streets.

Erie, Pa.—Council has passed ordinance providing for 9-in. sanitary sewer in Raspberry St.

Philadelphia, Pa.—Modern sewerage system at cost of about \$500,000 is being urged.

Itasca, Tex.—City has voted in favor of bond issue in sum of \$15,000 for installation of sewer system.

Ogden, Utah.—City is considering construction of sewer system north of the Ogden River.

Onkendale, Wash.—Sawyer Bros., civil engineers, with offices in the Lindelle Building, have obtained contract with town for making preliminary surveys and plans and preparing estimates for sewer system for this place.

Sheboygan, Wis.—Resolution has been passed authorizing board of public works to issue notice to contractors to furnish all labor and material for installation of sanitary sewers in following streets: Buffalo St., 2,325 ft.; Pine St., 2,855 ft.; Gidding Ave., 2,312 ft.; Summer St., 585 ft.; School St., 495 ft.; Elm St., 515 ft.; Detroit St., 1,368 ft.; and Cedar St., 740 ft. Contracts will also be let for lateral and private sewers where such has not been done by property owners. Specifications are as follows: 15-in. double strength vitrified pipe, 340 ft.; 12-in. double strength vitrified pipe, 2,670 ft.; 10-in. double strength vitrified pipe, 165 ft.; 10-in. Standard vitrified pipe, 4,332 ft.; 8-in. Standard vitrified pipe, 3,564 ft.; 10-in. cast-iron pipe, class C, 24 ft.; 12-in. cast-iron pipe, flange joints, 100 ft.; 30 manholes, 3 flush tanks, 3 lamp-holes and 5 cu. yds. of concrete wall.

Spokane, Wash.—City will replace 150 ft. of 21-in. sewer, which failed recently, with 24-in. sewer.

Chippewa Falls, Wis.—City is considering construction of sewers in several streets.

Oshkosh, Wis.—Following low bids were received Mar. 16 for vitrified or cement sewer pipe: H. H. Strey for about 5,000 ft., Babbitz Ave. sewer, 15-in., at 62 cts., 12-in. at 57 cts., 5x12-in. Ys at 70 cts., 6x10-in. Ys at 60 cts.; Michigan St. sewer, 15-in., at 93 cts., 6x15-in. Ys at 70 cts.; Spruce St. sewer, 15-in., at 74 cts.; 12-in. at 59 cts., 5x12-in. Ys at 70 cts., 6x10-in. Ys at 60 cts.; 23d St. sewer, 12-in. at 69 cts., 6x10-in. Ys at 60 cts.; 24th St. sewer, 15-in. at 76 cts., 12-in. at 59 cts., 5x12-in. Ys at 70 cts., 6x10-in. Ys at 60 cts. Chris Johnson for about 1,000 ft., South Park Ave. and Plummer Ave., 10-in. pipe at 72 cts., 24-in. at \$1.80., 6x10-in. Ys at 50 cts., 6x24-in. Ys at \$2.15. G. H. Randall is City Engr.

CONTRACTS AWARDED.

Sacramento, Cal.—For construction of sewer in J St., to F. E. Frey. M. J. Desmond is city clerk.

Sacramento, Cal.—To W. J. Tobin for constructing sewer in alley between Laurel and Park Aves. M. J. Desmond is city clerk.

Macon, Ga.—To Turner & Mangham, local, for concrete and segment block sewer, 3 ft. to 12 ft. for distance of 4,000 ft. at following bid: 10 ft. sewer at \$10.10; 9 ft. sewer at \$8.96; 7 ft. sewer at \$7.33; 12 ft. sewer at \$12.17; 7 ft. sewer at \$6.60; 5 ft. sewer at \$5.60; 4 1/2 ft. sewer at \$5.38; 4 ft. sewer at \$4.40 and 3 ft. sewer at \$3.30; manholes, \$7.50; total bid, \$25,738.50. D. S. Jones is City Clerk.

Fort Wayne, Ind.—J. S. Sheets Construction Co. will be awarded contract for constructing main sewer in east end on its bid of \$21,857.88. Engineer's estimate for the job is \$28,000.

Lawrence, Kan.—Contracts for different work necessary for drainage of old river bed north of North Lawrence were let Mar. 8 in meeting of Maple Grove Drainage Board. A. R. Young & Co. was given contract for 30-in. sewer down Bridge St. Contract price was \$8,523.70. Young Co. was also given contract for levee around railroad trestle north of city limits and the concrete sluiceway and main line drainage ditch.

Benidji, Minn.—Contracts were awarded for Ditch No. 30, in Beltrami County, to Kohler Const. Co., Frazer, Minn., at \$15,508.75 and to Construction Company, Duluth, Minn., at \$230,922.94. J. L. George is Co. Auditor.

Anaconda, Mont.—Contract for paving Commercial Ave. awarded to Clifton &

Applegate, for \$36,156.50, and the construction of the sewer on the same street to the same company for \$5,614.70.

Niagara Falls, N. Y.—See "Water Supply."

Wildwood, N. J.—Contract has been awarded for sewage treatment plant, consisting of Sanitation R.-W. Process of Sewage Treatment, to James McLinden & Co., of Angelsea, N. J. The Sanitation Corporation of New York has subcontract for process of sewage treatment.

Fargo, N. D.—Firm of Frederick & Barnard, of St. Paul, was awarded contract for construction of three big drainage ditches in northeastern part of Cass County, North Dakota, between Grandin and Gardner. Estimated cost when completed, including rights of way and bridges, will be about \$100,000. Frederick & Barnard's bids were \$19,750.92, \$18,297.98 and \$18,857.88. Jardine & Anderson of Fargo were awarded contract for bridges at \$12.49 and \$12.75 per lin. ft.

Shaker Heights, O. (Cleveland post office).—For improving storm and sanitary sewers in Shaker Blvd., from Courtland Blvd. to Warrenville Center Rd., to J. Connelly Construction Co., 520 Leader-News Bldg., Cleveland. B. W. Willard is Village Engineer.

Youngstown, O.—For sewer system in McGuffey St. from Old City Limits Line to Bond St., to Anthony O'Hara, at \$7,299. F. M. Lillie is City Engineer.

Youngstown, O.—For sewers as follows: Warren Ave. sewer to Edward Conicote, at \$6,950; Part Court sewer to M. F. Clark, at \$2,619; Oak Hill Ave. sewer to Anthony O'Hara, at \$634; South Ave. sewer to Dell & Serafino at \$5,840; Market St. sewer to Dell & Serafino at \$10,480. F. M. Lillie is City Engineer.

Erie, Pa.—Following contracts have been awarded for sewer construction: For 9-in. sanitary tile sewer in Raspberry St. to Jos. McCormick & Sons at \$767.40, engineer's estimate \$1,160; for 9-in. sewer in 30th St., to same firm at \$606; engineer's estimate \$1,020.

Providence, R. I.—Contracts for building sewers have been awarded by Board of Contract and Supply as follows: McDonough St., W. B. Shaw, \$10,630; Ardmore St., Charles Crankshaw, \$11,993; Charles St., Gammino Construction Co., \$6,077.25; Hawkins, st., W. B. Shaw, \$24,708.95; Channing Ave., The Valley Co., \$565.70; Lester St., Nelson W. Colgrove, \$520.20; Manning St., Lyons Bros., \$1,454.60; Hilltop Ave., Nelson W. Colgrove, \$3,114; Hillhurst Ave., Gammino Const. Co., \$1,553.65.

Fond du Lac, Wis.—For storm sewers in Dixie, Everett, Juneau, Rees and Baumister St. and Fond du Lac Ave., to P. F. Boulay & Bros. John McCullough is City Engineer.

Oshkosh, Wis.—For laying 9,742 ft. 20-in. vitrified sewer pipe and 5,320 ft. 12-in. vitrified sewer pipe, to C. R. Meyer & Sons Co., at 55 cts. for 12-in. pipe, 57 cts. for 20-in. pipe, manholes included. All vitrified pipe furnished by county, all other materials furnished by contractor.

Racine, Wis.—Contracts have been awarded as follows: For construction of pile and concrete outfall for Sixteenth St. sewer to Fred Nelson, local, at \$5,475; for pile and concrete outfall for English St. Sewer to P. W. Galloway, local, at \$8,730; for approximately 650 lineal feet 12-in. pipe sewer at \$1.50 in Twelfth St. to Pat Gavahan, local, for about 373 lin. ft. 18-in. pipe sewer at \$1.70 for overflow sewer from intersection of Washington Ave. and Deane Boulevard to Twelfth St., to Pat Gavahan, local, Louis J. Bessinger is Clerk.

Racine, Wis.—Contracts have been awarded as follows: For sewers in 13th St. approximating following quantities: 605 lin. ft. 30-in. brick sewer, \$3.90; 520 lin. ft. 18-in. pipe sewer, \$1.90; 250 lin. ft. 12-in. pipe sewer, \$1.80; 1,215 lin. ft. 8-in. pipe sewer, \$1.25; 9 manholes at \$40.00; 10 catch basins at \$42.00. to P. B. Johnson, local. For sewer in Birch St. from 9th St. to 11th St., approximating the following quantities: 720 lin. ft. 15-in. pipe sewer, \$1.35; 2 manholes at \$30.00; 2 catch basins at \$35.00, to Nelson & Sons, local. For sewer in Blaine Ave. from Kinzie Ave. to Osborne Blvd., and Osborne Blvd. from Blaine Ave. to Grace-land Blvd., approximating the following quantities: 900 lin. ft. 24-in. brick sewer, \$3.34; 440 lin. ft. 21-in. pipe sewer, \$2.65; 3 manholes, at \$40.00; 4 catch basins, at \$45.00, to Nelson & Sons, local. For sewer in Isabelle Ave. from Douglas Ave. to C. & N. W. Ry., approximating the following quantities, to-wit: 566 lin. ft. 12-

in. pipe, \$1.45; 1 manhole, at \$40.00; 2 catch basins, at \$42.00, to P. B. Johnson, local. For sewer in Augusta St. from Douglas Ave. to C. & N. W. Ry. approximating the following quantities, to-wit: 611 lin. ft. 12-in. pipe, \$1.60; 1 manhole, at \$40.00; 1 catch basin, at \$42.00, to P. B. Johnson, local. For sewer in William St. from Douglas Ave. to C. & N. W. Ry. approximating the following quantities, to-wit: 585 lin. ft. 12-in. pipe sewer, \$1.60; 1 manhole, at \$40.00; 2 catch basins, at \$42.00, to P. B. Johnson, local. Louis J. Blessinger is Clerk.

WATER SUPPLY

Stockton, Cal.—City Council has been petitioned for larger water mains and fire hydrants. Matter was referred to Mayor Vullahan.

Boulder, Colo.—Purchase of 16-in. water pipe for Pearl St. main was presented to members of City Council Mar. 10 by Alderman Webber, chairman of water committee, and was authorized by them.

Wilmington, Del.—Whether Council will take any action on request of Water Commissioners' request for \$425,000 for extension and improving of the water system is not known. It is conceded by members of City Council that such an appropriation will have to be made within a short time, however, as new reservoir and pump are needed to care for city's water supply.

Athens, Ga.—Selection will soon be called to vote bonds for water works extension.

Trenton, Ky.—City Council of Trenton has granted franchise to South Kentucky Power & Light Co. for water works plant to be put in here. It is intention of the company to have plant in operation within 60 days.

Crowley, La.—Brokerage firm of Rudolph, Kley-Bolte Co., of Cincinnati, O., has offered City Council 98 cts. flat for city's \$35,000 water and light bonds, to be paid out of earnings of plant. Bonds cover a period 15 years. As these proposed bonds are not secured by special tax city is asked to give mortgage on plant.

Lake Charles, La.—Plans and specifications are in progress for water works improvements and new water supply for Lake Charles, La. Burns & McDonnell, Inter-State Bldg., Kansas City, Mo., are engineers.

Amherst, Mass.—Town contemplates purchase of Amherst Water Co.'s property for municipal water works. It was voted to call special town meeting, at which matter shall be considered.

Andover, Mass.—Legislature will issue bonds in sum of \$10,000 for extension of water works.

Beverly, Mass.—Plans are being discussed for installation of filtration plant at cost of from \$325,000 to \$350,000.

Fall River, Mass.—Plans are being discussed for improvement of Quequechan River at expenditure of \$10,000.

Scituate, Mass.—If present plans mature, bids for construction of great \$5,000,000 dam at Kent for new Scituate reservoir will be asked within six months by Water Supply Board.

Preliminary work on reservoir site has progressed so rapidly that present indications point to asking of dam construction bids months ahead of time originally estimated.

Work on building of dam will be first construction step toward creation of the 37,000,000-gallon reservoir which, when completed, will cover practically whole of North Scituate, South Scituate, Saundersville, Ashland, Richmond and Kent.

Cost of dam itself, engineers estimate, will be between \$4,000,000 and \$5,000,000.

Escanaba, Mich.—Preliminary plans and specifications are completed for water works improvements, estimated cost of entire work being \$443,000. Bond election for above amount will be called within a short time. Burns & McDonnell, Kansas City, Mo., Engineers.

Saginaw, Mich.—Petition has been presented to Council asking that water main be constructed in Pleasant St.

Duluth, Minn.—See "Streets & Roads."

Wadena, Minn.—Town has voted in favor of bond issue for water works purposes.

Pass Christian, Miss.—City will erect water works plant and system to cost about \$40,000, using part of proceeds of recent bond sale.

Glendive, Mont.—Plans for filtration plant and water works improvements are in progress for city. Estimated cost, \$65,000. Board election called for May 15. Burns & McDonnell, Kansas City, Mo., are Engineers.

Harlowton, Mont.—Town has voted

\$15,000 to be used to extend and improve its present water system, and April 4 will vote \$25,000 worth of bonds to install a sewerage system and disposal plant. George E. Baker of Whitehall is consulting engineer on this work.

Danabrog, Neb.—Question of water works for village will come up at spring election.

New Brunswick, N. J.—Announcement was made by Mayor Farrington at meeting of the City Commission Mar. 14 that plans and specifications for filtration plant that is to be erected under direction of Advisory Water Commission on reservoir site, will be ready shortly when bids will be asked for.

Rockaway, N. J.—Borough Council decided Mar. 9 to install water meters in borough, as recommended by Water Committee, which had studied meter system in other towns and reported it most economical plan and best way to prevent wasting of water.

Niagara Falls, N. Y.—See "Sewerage."

Perry, N. Y.—Two propositions will be submitted to taxpayers of village at election. One is permission to borrow not more than \$30,000 for buying site adjoining pumping station at Silver Lake and building filtration plant. Two tracts of land for garbage dumping ground are considered in other proposition.

Rochester, N. Y.—Owing to desire of prospective bidders to look over ground before submitting their bids for laying 9.66 miles of water pipe in city's third conduit from Hemlock Lake, receiving of bids, which was advertised for March 15 by board of contract and supply, has been postponed for week or two. Section to be laid is between the pipe laid in 1914 and Rush Reservoir, and the estimated cost of section is \$600,000. The pipe to be laid is 37 ins. in diameter.

Syracuse, N. Y.—Bids for 480 tons of cast iron pipe for Bureau of Water for extension of service have been received by the Board of Contract and Supply. Lowest bids for 250 tons of 10 to 12-in. pipe and 220 tons of 6 to 8-in. pipe were by J. B. Clow & Son at \$29.60 a ton and for 10 tons of special casting low bid was by Charles Miller & Son at \$59.53 a ton. For 21,000 lbs. of lead pipe for the bureau, Charles Miller & Son were lowest bidders at 7.73 cts. a lb.

Alamogordo, N. M.—Town has made contract to purchase properties of Alamogordo Improvement Co., Alamogordo Water Works Co. and Alamogordo Light and Power Co. Consideration is to be \$300,000. This contract will be submitted for ratification of qualified electors of town on April 4, when matter of bond issue of \$300,000 will be decided.

Clovis, N. M.—Plans are in progress for improvements and extensions to water works and lighting plant. Estimated cost, \$35,000. Burns & McDonnell, Kansas City, Mo., are engineers.

Cincinnati, O.—Council has ordered special election to be held April 25 to vote on bond issue in sum of \$400,000 for purpose of extending, enlarging and improving water works system.

Coshocton, O.—Ordinance appropriating \$20,000 for purchase and installation of new 3,000,000-gallon vertical pumping engine to be installed in water works pumping station of Coshocton was passed at meeting of City Council Mar. 13.

Covington, O.—Installation of filtration plant at reservoirs near Ft. Thomas has been recommended.

Lima, O.—Voters will have submitted to them at April primary two separate ballots in addition to all others which concern issuance of \$650,000 worth of bonds in all to cover cost of new storage reservoir and pay city's share of expense in paving 49 streets.

Middletown, O.—Plans for proposed pump house and storage reservoir to be constructed as a part of new water works improvement were approved Mar. 10 by city commission.

Middletown, O.—See "Sewerage."

Creswell, Ore.—Committee has requested that some action be taken by council to prevent waters of slough running through eastern part of town from being contaminated with offensive matter. Subject was referred to health committee for investigation and report.

Vale, Ore.—See "Streets and Roads."

Yoncalia, Ore.—City has passed ordinance calling for election for April 17 to submit question of \$20,000 bond issue for construction of municipal water system. Proposed issue of \$2,300 paving bonds will also be submitted. M. B. Germond, Engineer Water System.

Drummondville, Que.—Following bids were received for pumping station and gravity filter: Lawin & Lutch, Mon-

treal, \$47,900; L. A. Ott & Co., \$48,340; Arsenanet & Plomondon, \$47,780; Century Engineering Co., \$56,143.25; A. Duke, \$54,860; Roberts Miller, Darby, P. Q.; S. A. Hamilton, Montreal, \$63,386; W. A. Moisan is Town Clk.

Warwick, R. I.—Town Council was informed by Edward W. Shedd Mar. 14 that private corporation proposes to establish water system in this town and sell water for domestic, manufacturing and all other purposes. Corporation known as the West Shore Water Co. is behind project, and an act giving corporation its identity and power to do business was introduced in the lower branch of Assembly Mar. 15 by Representative Richard S. Aldrich.

Coleman, Tex.—Henry E. Elrod, Southwestern Life Bldg., Dallas, Tex., has been retained by City of Coleman, Tex., to design and supervise construction of reinforced concrete reservoir.

Dallas, Tex.—Ninety tons of cast iron water pipe, 4 and 6 ins. in diameter, will be purchased by city for water main extensions. City Secretary J. B. Winslett was instructed Mar. 8 by Board of City Commissioners to advertise for bids on pipe.

Fort Worth, Texas.—City Mar. 7 purchased \$5,000 of its own bonds as investment for sinking fund. Block was from 1911 reservoir issue. Warrant was allowed for \$5,732.50. Of this amount \$645 was for premium and \$87.50 for accrued interest.

Ogden, Utah.—Petition for extension of water mains on 12th St. has been granted.

Everett, Wash.—Bonds for municipal water works improvements for city have been sold and the plans will be completed about April 15. Bids will be received few weeks later. Cost of extensions and improvements, \$600,000. Burns & McDonnell, Kansas City, Mo., Engineers.

Milwaukee, Wis.—O'Brien & Jackson were low bidders at \$480,000 for extension of Linwood Ave. intake water tunnel for a distance of 2,500 feet.

Sheboygan, Wis.—Council contemplates installation of chlorine plant, at cost of \$2,000.

Sheboygan, Wis.—Bids for new pumps showed only two offers, one from Snow Co., Buffalo, N. Y., for \$29,275, and one from Allis-Chalmers Co., Milwaukee, Wis., for \$29,675, though latter pump was fully ten tons heavier. Pumps are known as horizontal, high-duty, plunger style, with cross-compounding condenser. Snow Company's machine has capacity of 12,000,000 gals. with 36-in. stroke; but price it makes does not include foundation, which will be erected by city. The Milwaukee pump has 42-in. stroke, with same capacity as Snow; but it will be erected one month earlier.

Niagara Falls, Ont.—Water works board met Mar. 10 in City Hall. Request was received from Oneida Community Co. asking that fire hydrant be installed near its plant was granted. An electric recording meter and transformers were ordered installed in pumping station. Frank Bell was awarded the trenching contract for fiscal year, beginning April 1.

CONTRACTS AWARDED.

Boulder, Colo.—City council has awarded contract to F. C. Moys Hardware company for purchase of 1,850 feet of 16-inch water pipe.

Berwyn, Ill.—Contract has been awarded to H. D. Hallett, Aurora, Ill., for supplies for water works department.

Allen, Ind.—To A. H. Hattersley, for deep well pump at \$325, and to supply lime at \$233.

Ligonier, Ind.—For 400 water meters to Pittsburgh Meter Co., East Pittsburgh, Pa. R. E. Nament is City Clerk.

Audubon, Ia.—Contract for extension of water mains in Audubon, hydrants, etc., was let to Ward & Weighton, they being lowest bidders. Six companies had bids. Ward & Weighton will commence operations as soon as possible. Following is a list of those bidding, and the amount of bids: Ward & Weighton, \$14,193.30; Donnegan & Briggs, Shenandoah, \$14,723.21; Roland Construction Co., Des Moines, \$15,095.80; Katz Construction Co., Omaha, \$15,478.50; Elk Horn Construction Co., Fremont, Neb., \$15,846.60; Morrison Construction Co., Des Moines, \$19,097.80.

Atlantic City, N. J.—To Rensselaer Valve Mfg. Co., Troy, N. Y., for high-pressure valves at \$10,661. Other low bids were: A. P. Smith Mfg. Co., East Orange, N. J., at \$11,793.50; R. D. Wood Co., at \$12,113.

New Brunswick, N. J.—Contract was

The Fine Screening Method of Sewage Treatment

The success of this particular method abroad in

GERMANY

RUSSIA

NORWAY

FRANCE

And Now In This Country

has established its recognition and adoption.

Clarification and Purification of Sewage

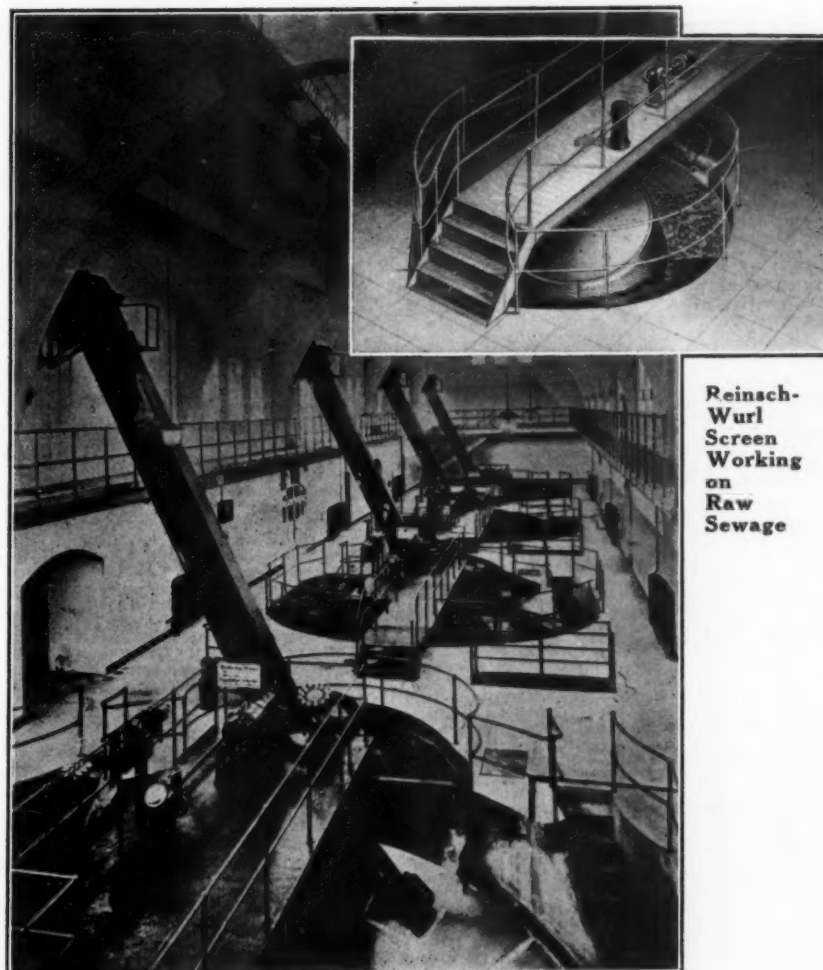
Reduction of Water Content in Sewage Sludge

Recovery of By-products from Sewage Sludge

Let us show you

Riensch-Wurl Screens

will handle your proposition most economically and efficiently.



Reinsch-Wurl Screen Working on Raw Sewage

Sewage Treatment Plant of the City of Dresden, Saxony
Four Riensch-Wurl Screens, each 26 feet in diameter.

"Mechanical Treatment of Sewage in Germany"

Doctor Endris, Engineer with the City of Hamburg, Germany, author of numerous papers on the art of sewage treatment and regular contributor to *Wasser und Abwasser* (Berlin), etc., has written a very interesting article on Riensch-Wurl Screens, the most modern and effective screens for sewage service. To secure this article, please write for BULLETIN, Series G, No. 3.

THE SANITATION CORPORATION

Apparatus, Equipment and Complete Plants for Sewage Disposal
50 CHURCH STREET NEW YORK CITY

awarded to Standard Cast Iron Pipe & Foundry Co., Bristol, Pa., for 400 lengths of 8-in. pipe, and 225 ft. of 12-in. pipe, at \$28.75 per 2,000 lb. ton, and also for specials at 3 cts. per lb. This company was lowest bidder. Contract for two new pumps for water department to be installed at Weston's Mill station, was awarded to Thos. J. Radley Co., Inc., of New York City, upon their estimate of \$14,100, they being lowest in bidding.

New Brunswick, N. J.—Contract for cast iron pipe was awarded to Standard Pipe and Foundry Co., Bristol, Pa., for \$28.75 per ton of 2,000 lbs.; specials, 3 cts. per lb. f. o. b. New Brunswick, N. J. Other bidders: Donaldson Iron Co., \$30.20; Warren Fd. & Machine Co., \$29.20; U. S. Cast Iron Pipe & Fd. Co., \$2.35; Central Foundry bid on Universal Pipe, 48 cts. ft. for 6-in, 70 cts. for 8-in. and \$1.29 for 12-in. Asher Atkinson, City Engineer.

New Brunswick, N. J.—Contract for 2 5,000,000-gallon turbine driven centrifugal pumps, head 150 ft., steam pressure 165 lbs.; duty 110,000,000 ft.-lbs. has been awarded to Thos. J. Radley, Inc., 143 Liberty St., New York City, for \$14,100, erected on foundations to be built by city. Other bidders were: Turbine Equipment Co., 30 Church St., New York, \$14,700; C. H. Wheeler Mfg. Co., \$16,100. Asher Atkinson is city engineer.

Niagara Falls, N. Y.—Contracts have been let by City Council for sewer and water mains in Union St. and Royal Ave. to connect with proposed plant of Isco Chemical Co., which intends to build a \$200,000 plant this spring. City will supply the pipe. There were three bids for sewer. Shepard & Co. bid \$933.10, Nick Nolfe \$594.65, & Dominick Spaconne \$635.35. The contract was let to Nolfe. Five bids were received for water main for which city will also furnish the pipe. McKenna & McGuire bid \$1,274.74; Joseph Reich & Bro., \$1,072.96; Nick Nolfe, \$1,796; Shepard & Callahan, \$1,291.80; Dominick Spaconne, \$1,302.68. Reich was awarded contract.

Plattsburg, N. Y.—Board of public works has awarded a contract for installation of chlorine system at storage reservoirs, thus insuring city of pure water. Improvement will cost \$560 and is to be completed by May 1.

Rochester, N. Y.—For supplying corporation cocks for water works bureau, for season of 1916, to H. Mueller Mfg. Co., at \$1,104.95. United States Cast Iron Pipe & Foundry Co., of Buffalo, bid \$60 per ton for special castings and \$29 per ton for pipe.

Youngstown, O.—Board of control has awarded contracts to various manufacturing firms for general supplies, which include cast iron pipe, fire hydrants and other material. United States Cast Iron Pipe Co. was given contract for 100 tons of pipe at \$30.62 per ton on all sizes from 6 to 20 inches. Price on 4-inch pipe was \$33.52 per ton. This company will furnish the special castings for three and one-quarter cents per pound. Morgan Manufacturing Co. was awarded contract for supplying 250 or less valve boxes, from 4 to 8 inches in diameter at \$2.90 per box. Wilkoff Bros. was only bidder on 50 tons or less of pig lead and were given contract at \$7.35 per 100 lbs. R. D. Wood Co. was awarded contract for furnishing 80 or less fire hydrants at \$28.45 to \$130 each.

Salt Lake City, Utah.—For constructing water main extensions to Wheelright Construction Co., Ogden, Utah, at \$85,060.50. Other bidders were: Espey T. Cannon, city, total bid \$89,107; James Kennedy, city, \$88,784; R. C. Green, city, \$88,347.75; Mullins & Palm, city, \$87,788.50; Parrott Bros., Co., \$87,774; P. J. Moran Constr. Co., \$87,596.75; H. G. Gilkerson, \$85,582.

Kewaunee, Wis.—For water works to Gray Robinson Construction Company, Manitowoc. James W. Cain is City Clerk.

Sheboygan, Wis.—To Allis-Chalmers Co., Milwaukee, Wis., for pump with capacity of 1,000,000 gallons at \$29,335.

Lander, Wyo.—To Samuel Jensen, local, for improving water works system, at \$5,350.

MISCELLANEOUS

Selma, Ala.—City will build street level wharf with adequate elevated service at estimated cost of from \$5,000 to \$10,000.

Pueblo, Colo.—Plans and specifications for new municipal building will be presented to city commissioners by May 10. Four Pueblo architects who are figuring on proposition have been notified to have their drawings ready by that time.

Wilmington, Del.—City Council consid-

ering resolution providing for bond issue of \$65,000 for extension and improving of park system of city. Members of Council in committee of whole Mar. 15, conferred with members of Park Board, the Park Commissioners desiring \$100,000 for this work. It was agreed to allow Park Commission \$65,000, of which \$24,000 will be expended for park lands in lower end of the Ninth Ward.

Washington, D. C.—Commercial agent of Bureau reports that firm in Norway is in market for iron body gate valves, with brass gate, in sizes from ½ up to 3 inches, threaded. It is stated that about 50 pieces of each size are required. No. 20,513.

Washington, D. C.—Firm in Spain informs American consular officer that it desires to purchase steam and water turbines; gas, gasoline, and crude-oil motors; electric machinery of all kinds, including copper and aluminum cables, wire, meters, etc.; and pumps of all kinds. References are given. Correspondence may be in English. No. 20,464.

Danville, Ill.—Court authorized holding of election April 4 to determine whether bond issue of \$55,000 for park purposes shall be made.

Kokomo, Ind.—County commissioners have contracted for three graders at cost of \$200 each; five Aeroplane graders, at cost of \$195 each, and 12 three-way drags, at cost of \$32.50 each.

Louisville, Ky.—Notice has been given by Mayor R. W. Morris that Board of Public Works will take final action in matter of granting to Kentucky & Indiana Railway & Terminal Company franchise for switch connecting Pennsylvania railway tracks with Kentucky & Indiana bridge at meeting March 30. Following final action of Board of Works, franchise must be ratified by City Council before it becomes effective.

Andover, Mass.—Appropriation of \$47,000 has been made for schools.

Pittsfield, Mass.—The common council has adopted order appropriating \$5,600 to buy an oil and water sprinkler.

Keweenaw Point, Mich.—In response to call for bids on maintenance and improvement work at the harbor of refuge at Keweenaw Point, Mich., Maj. E. D. Peek has received twelve proposals and has recommended for acceptance that of Fir Tree Lumber Co. of Tacoma, Wash., whose bid was \$5,477.61 for lumber advertised for. Bids ranged from that figure to \$6,928.61. Only one Duluth company, Woodruff Lumber Co., put in a bid, most of those entering proposals being Pacific coast concerns.

Saginaw, Mich.—Appropriation of \$600 for park expenses has been recommended.

Pass Christian, Miss.—Entire issue of \$96,000 of municipal improvement bonds of city of Pass Christian was sold Mar. 11 to the Interstate Bank & Trust Co. of New Orleans, for premium of \$3,171, and accrued interest. Bonds will bear 5 per cent.

Beach Haven, N. J.—Extensive beach front improvements, at a probable cost of \$25,000, have been planned for the coming season by the borough council. The construction of 1½ miles of new board walk will be a feature. The town government will also erect several jetties for the protection of beach front lands.

Brooklyn, N. Y.—Following bids were received for completion of construction of station finish at Hunter's Point Ave. Station, on Queen's borough subway line: Degnon Contracting Co., at \$32,219.21; A. L. Guidone & Son, Inc., at \$37,000, and Snare & Triest Co., at \$41,259.

Perry, N. Y.—See "Water Supply."

Cleveland, O.—Sealed bids will be received at office of sinking fund commission, room 507, city hall, Cleveland, until noon, April 10, for purchase of \$425,000 4½ per cent city of Cleveland city hall coupon bonds issued Nov. 11, 1914, drawing interest from Oct. 1, 1915, and maturing Oct. 1, 1944. C. J. Neal is secy. sinking fund commission.

Columbus, O.—Election will be held April 25th, to vote on bond issue in sum of \$320,000 for purpose of supplying deficiency in revenues of city. George J. Karb is Mayor.

Lima, O.—Legislation has been prepared and will be adopted for increasing force of city engineering department to make river survey. J. F. Cupp, acting engineer during absence of Carl Bryson, will be retained as special assistant in charge of river survey.

It is now plan of council to hurry survey so that legislation for bond issue may be prepared in time to have question voted upon at primary of April 25. At that time \$100,000 street improvement

bonds and \$550,000 reservoir bonds, will be before the voters.

Lima, O.—City council Mar. 13 decided to submit bond issue of \$100,000 for Hog Creek improvement project to voters at the primary of April 25.

Miami, Okla.—Contract has been awarded for construction of new courthouse for Ottawa county at Miami, and work will be begun immediately. Building completed will cost about \$75,000. Bonds were recently voted for structure.

Muskogee, Okla.—Citizens at special election Mar. 7 voted \$80,000 bonds for public parks by vote of 1,043 to 95.

Williamsport, Pa.—City is contemplating construction of comfort station.

Providence, R. I.—In Board of Aldermen communication was received from Board of Park Commissioners through its secretary, Robert Johnston, requesting appropriation of \$22,000 for erection of rest house to be utilized as a building for the storage of tools, field house, boat house and sanitary quarters. Communication also provides that if city makes appropriation James C. Potter, chairman of Board of Park Commissioners, will erect an \$8,000 band stand. Communication closed with request that immediate action be taken in order that buildings may be erected during spring months. Communication was referred to finance committee.

Greenwood, S. C.—City will receive proposals Mar. 28 for purchase of street improvement city of Greenwood assessment certificates, said certificates to be made in denominations to suit purchaser, payable in New York or Chicago, and bearing interest at 6%. Said certificates to be of total issue not less than \$40,000 and not more than \$80,000. All those submitting proposals required to give certified check of \$1,000 as evidence of good faith. A. S. Hartzog is Mayor; J. Williams Watson is Clerk and Treasurer.

Alta Loma, Tex.—At regular meeting March 2 of board of city commissioners Commissioner M. E. Shay asked and was granted authority to advertise for bids on two oil engine-driven generators to supply current for operation of three new wells at Alta Loma, recently contracted for. Estimated cost of new generators is \$18,000, which would bring expenditures on new water supply facilities authorized thus far to about \$37,000.

Fort Worth, Tex.—\$50,000 worth of Fort Worth municipal bonds were bought by city March 10 at saving of \$32,297.62 for 35 years they have to run, on basis of present rate of interest allowed on sinking fund deposits. Bonds are of 1911 issue and are five years. They are due in 1915, with an option in 1931. Finance Commissioner Smith did not know when he authorized purchase whether bonds were of big reservoir issue of 1911 or some other issue of that year, there having been issued a total of \$2,000,000 worth five years ago.

Galveston, Tex.—In compliance with instructions from city commission, City Engineer A. T. Dickey has prepared estimates of cost of surfacing with mud-shell proposed seawall improvement fill, along and near gulf front from Sixth to Thirty-ninth St. Estimate is \$23,400.

Paris, Tex.—See "Sewerage."

Ogden, Utah.—City will purchase soon three automobiles for use of department heads.

Ogden, Utah.—Proposed improvements of city hall, including installation of modern comfort station, will cost \$11,592 if lowest bids submitted to commissioners Mar. 6 are accepted. C. J. Humphreys agreed to do general work for \$8,765; Halverson Bros. plumbing for \$191, and Halverson heating installation for \$908. These were lowest of several bids received, but all were referred to committee of whole for further consideration.

Milton, Vt.—Town has appropriated \$15,000 for Clark memorial building.

Norfolk, Va.—City council, Mar. 9, adopted resolutions that will result in extension of Belt Line railroad to Norfolk side of river, and establishment of municipal docks and warehouses at terminus of this extension.

Oakville, Wash.—See "Lighting and Power."

Sheboygan, Wis.—Council has adopted report of committee recommending construction of workhouse.

Superior, Wis.—At meeting held March 10 resolution was passed by city commission providing for construction of culvert across Grand Ave. southeast of 21st St. Board of public works was authorized to call for bids.



East Depot Street, Latrobe, Pa., Tarvia-mixed-macadam over brick pavement.

What they did with an old brick pavement—

The old brick pavement on East Depot Street, one of the best residential streets in Latrobe, Pa., was badly worn and full of uneven places.

The authorities felt the need of improving the street which is on the main trunk line for automobiles between Philadelphia and Pittsburgh, but decided that instead of going to the great expense of repaving with brick they would have it resurfaced with a hot "Tarvia-X" and crushed stone mixture. As a foundation the brick still had possibilities.

The surface of the pavement was thoroughly cleaned and the depressions filled with the hot mixture which was compacted by rolling, after which the pavement was ready to receive a two and one-half (2½) inch course of the Tarvia-mixed-macadam surfacing. After the mixture was uniformly spread it was covered with a light course of clean stone chips, and rolled to a finished depth of two (2) inches.

A seal coat of Tarvia was then spread over the entire surface and covered with stone chips, followed by the final rolling. The street was closed for several days while the mixture was in process of setting, after which traffic was admitted.

As a result Latrobe has a beautiful pavement, smooth, quiet and durable, at comparatively small expense. The worn-out brick makes an ideal foundation—better than a new foundation. Its very roughness becomes a virtue since it interlocks with the new Tarvia-mixed-macadam surfacing. "Tarvia-X" is the only bitumen suitable for this purpose. Other bitumens lack the essential capacity of adhering to the brick.

We have had considerable experience with "Tarvia-X" for re-surfacing worn out brick pavements and shall be glad to give anyone interested the benefit through our Service Department.

Booklets on request.

Special Service Department

This Company has a corps of trained engineers and chemists who have given years of study to modern road problems.

The advice of these men may be had for the

asking by anyone interested.

If you will write to the nearest office regarding road problems and conditions in your vicinity, the matter will have prompt attention.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati
Pittsburgh Detroit Birmingham Kansas City Minneapolis Salt Lake City Seattle Peoria
THE PATERSON MANUFACTURING COMPANY, Limited: Montreal Toronto Winnipeg
Vancouver St. John, N. B. Halifax, N. S. Sydney, N. S.



Portsmouth, Va.—Norfolk County Bd. of Supervisors, Mar. 14, agreed to purchase site and erect incinerator near seashore resort. Of funds necessary for incinerator Virginia Railway and Power Company agrees to furnish \$1,000 while Wells interests will furnish another \$1,000. This leaves about \$2,500 to be expended by the county. Two lots have been secured in Peachtree St. with ground area sufficient for two single-unit plants. It is estimated that needs of section can thus be taken care of for at least fifteen years, at present rate of growth shown by Ocean View. Work of erecting first unit incinerator will begin at once, and plant will be in operation by time the summer season begins.

Richmond, Va.—Nearly one-third of proposed \$2,000,000 bond issue will be for schools and sites. Exact amount recommended by the administrative board for this purpose is \$657,000. Of this amount \$175,000 is for new schools,

it said said, and remainder to pay back money, borrowed from local banks which has already been expended for school needs. Among other items approved by finance committee, according to excellent authority, are following: Sewers, \$350,000; water, \$258,000; Shockoe Creek, \$200,000; gas, \$109,000; Howitzers' Armory, \$75,000; city warehouse, \$35,000; Shields Lake, \$25,000; Fulton Park, \$15,000; Feitig property, \$20,000; Marshall Park, \$10,000; sidewalks, \$50,000; police station, \$33,000; electric plant, \$25,000; other permanent improvements, \$237,000.

CONTRACTS AWARDED.

Louisville, Ky.—Contract awarded to D. M. Moynahan for collection and disposal of garbage during year at \$7,145.

Port Jervis, N. Y.—Contract for erection of borough building was awarded to Dennison & Co., of Honesdale, who were lowest bidders. Amount of bid was \$4,488.71.

Conneaut, O.—The bid of the General Electric Co. for a generator, amounting to \$1,328, and of the Skinner Engine Co., of \$3,715, for the engine, were accepted by the board of control, these being the two lowest in either class.

Mansfield, O.—For removal of garbage for five years to Edwin D. Ford at bid of \$5,005. Other bidders were as follows: S. L. Houston, \$5,150; Fred Ackerman, \$3,800; Bolus & Lemon, \$3,250.

Pittsburgh, Pa.—Direct trolley connection between Pittsburgh and Cleveland will be afforded by construction of connecting link between Akron and Youngstown, contract for which has just been awarded to H. D. McCutcheon & Co., Pittsburgh contracting firm with offices in Shannon Bldg., Fourth Ave. Company will construct and equip line and contract calls for immediate beginning of work and its completion before end of the present year.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS				
Mass.	Beverly	7.15 p.m., Mar. 28	Bituminous and asphalt binders and road oil	F. B. Browning, Clerk of Com.
Minn.	St. Paul	10.30 a.m., Apr. 3	Furnishing creosoted blocks, bricks, Portland cement, pitch and asphalt filler and other materials for paving streets; curbing and improving streets	August Hohenstein, Pur. Agt.
SEWERAGE				
Minn.	St. Paul	10.30 a.m., Apr. 3	Furnishing sewer pipe and sewer brick; constructing sewers	August Hohenstein, Pur. Agt.
N. Y.	Ocean Beach (Long Is.)	Apr. 4	Constructing sewers and sewerage treatment works	A. J. Provost, Jr., Engineer. 39-41 W. 38th St., N. Y. City.
Fla.	Jacksonville	8 p.m., Apr. 14	Constructing 18 miles 8 to 54-in. sanitary and storm water sewers	L. D. Smoot, Comr. Pub. Wks.
WATER SUPPLY				
W. Va.	Clarksburg	Apr. 1	One-story brick and concrete pumping station, 40x60	Geo. W. Fuller, Engineer, N. Y. City.
LIGHTING AND POWER				
N. Y.	Lockport	8 p.m., Mar. 31	7½ h. p. variable speed motor	Emmet Belknap, Clk. Bd. of Education.
MISCELLANEOUS.				
Ind.	Portland	9 a.m., Apr. 27	Constructing county court house	County Auditor.

STREETS AND ROADS

Palatka, Fla.—Twenty miles more of good roads were added to highways of Putnam County Mar. 14 when \$80,000 bond issue election for hard surfaced road from Palatka to Orange Springs was carried by an overwhelming majority.

Peoria, Ill.—Five paving contractors submitted bids for paving Galena road from Grant St. up river for mile and an eighth, at meeting of the Averyhill board Mar. 15. These were D. A. Myers, Barnewalt Construction Co., Canterbury Bros., John McAllister and A. D. Thompson. The bids do not name lump sum but give price per yard for excavation, price per yard of cement work or brick works, etc. Engineer Ray Crozier who drew up plans, etc., estimated cost at approximately \$22,000, but this includes cement retaining wall which is not included in paving contract and which would make estimate about \$1,400 less or \$20,700. Unofficially it is understood that Barnewalt Construction Co. is lowest bidder at somewhere around \$20,000. This is considered too high and as board has right, it may reject all bids and do work.

Indianapolis, Ind.—Resolutions providing for permanent improvement of several streets were adopted Mar. 17 by the board of public works. B. J. T. Jeup, city engineer, said that many similar resolutions are being prepared and that there is an unusual demand for street improvements in territory in northern part of city which recently was annexed to Indianapolis.

Muncie, Ind.—At regular session of special committee of City Council Mar. 14, City Engineer B. F. Deardorff was ordered to prepare plans and specifications for following improvements: Resurfacing of Liberty St. and for curb and gutter from Lake Erie Railroad to 12th St.; local sewer in Sixth St. from Plum

to Monroe Sts. Engineer Deardorff was asked to investigate following proposed improvements and report on them Mar. 18; Eighth St. from Vine to Plum St.; Ebricht St. from Fifth to Sixth St.; Plum St. from Fifth to Sixth St.; opening and improving of Sixth St. from Hackley to Blaine St.

Peru, Ind.—Resolution was adopted for extension of improvement of Eighth St. from Tippecanoe St. to Water St., across railroad and on east on Elmwood Ave. to Chili Pike.

Lexington, Ky.—Ordinance has been passed repealing resolution No. 26 and ordinance No. 658 so far as same relate to unimproved portion of Angliana Ave., and rejecting and relieving bid of Carey-Reed Co. for such portion of said work.

Beverly, Mass.—Items on laying brick sidewalks were as follows: A, laying flat new, district one; B, flat new, district two; C, edge new, district one; D, edge, district two; E, herring bone, district one; F, herring bone, district two; G, end new, district one; H, end new, district two; I, blasting; J, backing; K, joints; L, flat, old; M, edge, old. John C. Fowler was only bidder and his figures were considerably higher than last year when he was given contract. His bid was as follows: A, 64c. sq. yd.; B, 75c.; C, 78c.; D, 79c.; E, 69c.; F, 82c.; G, 22c.; H, 24c.; I, \$3; J, 6c.; K, 10c.; L, 50c.; M, 60c. There were three bidders for furnishing curbstone, Rockport Granite Co. and Lovejoy Granite Co., of Milford, N. H., who had contract last year, both bid 69c. a foot for straight, curved, corners and special edgestones. Rockport Granite Co. bid 70c. on all items. Seven contractors bid for laying of granolithic sidewalks. Mark E. Kelley Co. of Peabody being lowest with a price of \$1.62 a yard against a price paid of \$1.70 last year. Figures were as follows: Arthur S. Huddell Co., Chelsea, \$1.69 a sq. yd.; J. E. L. McLean, Boston, \$1.74; D. J. Sheehan Co., Lynn, \$1.74; Simpson Bros., Boston, \$1.73;

Crosby & Cann, Beverly, \$1.80; John C. Fowler, Beverly, \$2. There were three bidders for setting edgestones, with E. M. Cahill the lowest. The items bid on were as follows: A, straight, new, district one; B, straight, new, district two; C, blasting; D, curved, new, district one; E, curved, new, district two; F, straight, old, district one; G, straight, old, district two. Bids were as follows: E. M. Mahill, A, 26c.; B, 28c.; C, 70c.; D, 28c.; E, 30c.; F, 24c.; G, 28c. M. Grady & Son, A, 28c.; B, 29c.; C, 75c.; D, 30c.; E, 30c.; F, 26c.; G, 30c. P. McSwiney, A, 27c.; E, 30c.; C, 70c.; D, 31c.; E, 32c.; F, 28c.; G, 30c. Three bids were submitted for sidewalk brick. Waldo Bros., of Boston, bid \$15.75 a thousand for water struck brick; Jay E. Day, Danvers, \$15.50 for No. One; \$16.50 for No. Two; \$17.50 for No. Three and \$11.85 for No. Four. The Parry Brick Co., \$13.75 a thousand. Committee took all bids under advisement.

St. Cloud, Minn.—Allotment of \$1,500,000 road and bridge fund to counties of Minnesota was announced Mar. 14 by Minnesota Highway Commission. Ramsey County is to get \$35,000 as its share, and similar amount was apportioned Hennepin and St. Louis Counties. Winona County comes next with \$30,000, which is explained by fact that county has about \$500,000 worth of work on state roads laid out for this year. Itasca County has been given \$27,000. Blue Earth County gets \$23,000 and Beltrami County will receive \$25,000 for its state aid. Cass County is to get \$22,500. Dakota County was allotted \$22,000. Among other counties getting more than minimum allotment are Stearns, \$21,000; Pine, \$21,000; Polk, \$20,000; Koochiching, \$19,000; Olmsted, \$18,000; Aitkin, \$17,500; Carleton, \$18,000; Lyon, \$17,000; Anoka, \$17,000; Morrison, \$17,000; Mower, \$17,000; Renville, \$18,000; Ottertail, \$20,000; Yellow Medicine, \$17,000; Rice, \$17,000; Redwood, \$17,500, and Washington, \$17,500.

F. B. BEASMAN & Co.,
General Contractors
 7 CLAY STREET.

BALTIMORE, MD.

January 13th, 1916.

Watson Wagon Co.,
 Canastota, N. Y.

Gentlemen:-

Do not send a man to see me; when I want wagons, you will get the order. On the start, I bought different makes and tried them all out, but have weeded them out until I now use about thirty and they are all Watsons. From the picture I am mailing, you can see a few of them which have been on Railroad jobs and under my shovel for five years and they are in good shape yet. Should you want any testimonials, I'm at your service and I thank you for the frank treatment from your Company.

Yours respectfully,

Frank M. Beasman

A Baltimore Contractor's Opinion of the WATSON

If there is any one place, more than another, where Watson wagons make the cheap dump wagons look like thirty cents, it is on steam shovel work.

There are very definite reasons why this is so. It's no accident. The other wagons usually get weeded out, just as Mr. Beasman says, when put to the test alongside of Watsons.

Read Mr. Beasman's letter. **Look at the general condition of the 5-year-old Watsons shown in the photograph.**

We still claim that nobody is going to give you something for nothing; that you can't get any more out of a dump wagon than the maker puts into it. Watsons cost you a little more in the first place, but it's the **last** cost that counts.

WATSON WAGON COMPANY, Canastota, N. Y.

The World's Largest Builders of Dumping Wagons

BRANCH OFFICES :

**256 Broadway, New York, N. Y. 1102 Farmers' Bank Bldg., Pittsburgh, Pa.
 604 Witherspoon Bldg., Philadelphia, Pa.**



St. Paul, Minn.—The following will be heard April 13 by Council: Grading Madison Ave., from Seventh St. to Youngman Ave.; Alton St., from Seventh St. to Youngman Ave., and Youngman Ave. from west line of lot 21, block 4, Youngman & Lamm's addition to Rankin St. Estimated cost, \$10,736.55; cost per foot, \$1.08. Grading Stewart Ave. from West Seventh St. to Purnell Ave. Estimated cost, \$12,739.72. Cost per foot, \$1.

St. Paul, Minn.—See "Sewerage."

Bloomfield, N. J.—Following bids were received Mar. 20 for Bluestone curb and trap rock gutter on Glenwood Ave.: Spatz Bros., for 2,600 lin. ft. 5x16-in. curb at 52c., \$1,352; 50 lin. ft. 5x16-in. Rad. curb at 92c., \$46; 870 sq. yds. T. R. gutter at 96c., \$835.20; total, \$2,223.20. Newark Blue Stone Co., at 46c., \$1,196; 75c., \$37.50; \$1.90, \$1,653, respectively; total, \$2,886.50. Filippone & Scanniello, at 51c., \$1,326; 75c., \$37.50; \$1.84, \$1,600.80, respectively, total \$2,964.30. Franklin Contracting Co., at 60c., \$1,560; \$1, \$50; \$1.85, \$1,609.50, respectively; total, \$3,219.50. R. B. Callahan & Co., at 51c., \$1,326; 90c., \$45; \$2.16, \$1,879.20, respectively; total, \$3,250.20. Ernest Baechlin is Engineer.

Bloomfield, N. J.—Following bids were received Mar. 20 for 470 sq. ft. 5-in. concrete sidewalk on Davey St.: A. J. Staknech, 13½c., \$63.45; Spatz Bros., 14c., \$65.80; Robert Doriety, 17½c., \$82.25. Ernest Baechlin is Engineer.

Dunkirk, N. Y.—Five sets of specifications for sweeping paved streets have been given out to prospective bidders. There are two propositions to be bid upon, one for sweeping all paved streets six days a week and other for sweeping most used streets each weekday and the other streets every other day.

Jordan, N. Y.—At public meeting of taxpayers Mar. 14 John C. McLaughlin, local attorney, cited figures of state engineer relative to cost of a 16-ft. concrete road through main street of Jordan. Improvement will extend from state road south of village to stretch north of Jordan. Trustees supported plan by an affirmative vote to widen road in the business section to 32 ft., from point north of the Erie Canal bridge to Heighoes crossing to 24 ft. and from that crossing to state road north of the village to 16 ft. Contracts for improvement will be awarded soon.

Lockport, N. Y.—Bids submitted to the Common Council by Mayor Earl Mar. 13, preparatory to purchase of stone crusher for the city, were referred to committee on streets for consideration Mar. 17. Mayor states there is need for crusher and urges immediate action. Bids are as follows: Gaellon Iron Works & Mfg. Co., Penn Yan, N. Y., No. 8½ A Acme stone crusher, 9x16 in. opening, \$969; No. 8½ D stone crusher, 10x16, opening, \$784; will allow \$50 for old stone crusher if placed on cars, Lockport, N. Y. Austin Mfg. Co., Chicago, Ill., No. 1 Aurora crusher, 9x16 opening, \$630; No. 3 gyratory crusher, 8½x24 opening, \$825; f. o. b. factory; will allow for old crusher its price at sale for junk. J. D. Adams & Co., Indianapolis, Ind., No. 7 A, 7x14, opening crusher, \$539; No. 9 A, 10x20, opening crusher, \$986; allow 5 per cent. for old crusher; all f. o. b., Frankfort, N. Y. The Good Roads Machine Co., Maratton, N. Y., No. 1½ Climax crusher, 8x15 opening, \$503 net; No. 2 Climax crusher, 9x16 opening, \$568.75 net. Will allow \$75 for old crusher and will send men to erect and start same with no expense to city.

Syracuse, N. Y.—Action was taken Mar. 16 by Board of Estimate and Apportionment, making available funds required by state to be provided before that section of East Genesee St. between pavement and city line can be improved full width as part of state highway. Amount estimated is \$19,100, representing additional cost of pavement of full street width above cost of 16-ft. concrete pavement width of a state highway. Funds will be raised by local assessments.

Greensboro, N. C.—Three hundred citizens of Guilford County appeared before County Commissioners at called meeting of board Mar. 15 in interest of proposed concrete asphalt highway between city and High Point. About half of the delegation favored building of the delegation favored building of road by way of Guilford College station, while other part of the assembly favored a more direct route by way of Jamestown. No decision was reached.

Gallon, O.—The \$25,000 Polk Township road improvement bonds were awarded to Security Savings Bank & Trust Co., Toledo, at premium of \$1,957.50. Bonds

bear 5 per cent. interest and mature from 1929 to 1933. There were 13 bidders.

Hamilton, O.—See "Water Supply."

Massillon, O.—Twenty-eight resolutions declaring it necessary to pave and gravel certain streets, construct sanitary and storm water sewers in others and authorizing issuance of bonds, subject to vote of people, at primary election, April 25, to provide city's share of the money to pay for improvements were presented at a meeting of City Council, Mar. 14, by Council as committee of whole and passed under suspension of rules. Only one resolution was held over for further consideration. That was paving of Canal St. from Tremont to Walnut Sts., city's estimated share of cost being \$9,000.

Tiffin, O.—Council has passed ordinance providing for bond issue in sum of \$19,000 for improvement of East Perry st. and in sum of \$16,000 for Apple St.

Erie, Pa.—Contract for paving of 24th St. from Ash St. to Railroad St. will be awarded to Mayer Bros. Construction Co. by Council as soon as sufficient money is obtained to pay city's portion of cost. Of three bids submitted Mar. 16 Mayer Bros. Co. was lowest. Their estimate of work is \$24,370. J. & M. Doyle Co. bid \$24,527 and John McCormick & Sons Co., \$24,558.60. City engineer's estimate was \$26,000.

Williamsport, Pa.—Mar. 16, in committee of whole, George K. Harris, superintendent of streets and public improvements, presented bids for truck which is to be secured for department. Bids are as follows: By Weaver & Callahan, Montoursville, International Harvester truck, model F, 1,500 pounds, \$970; model E, 1 ton, \$1,500; By Keystone Motor Car Co., Williamsport, Ford chassis truck, 1,500 pounds capacity, \$475; Jeffries truck, ¾ ton, \$1,025; Jeffries truck, 1½ tons, \$1,500. By La France Garage Co., Studebaker, 1 ton truck, \$1,230. By Keeler Motor Car Co., Koehler, 1 ton truck, \$935. By L. H. Shea, Kissel Kar truck, 1 ton, \$1,439.66; Kissel Kar truck, 1½ tons, \$2,302.46; self starter, \$150 extra. By E. L. Sheffer, Buick, ¾ ton truck, \$1,225; electric starter, less 18 per cent. Vim, model F truck, ¾ ton, \$695, less 18 per cent. Bids call for truck to carry 1,500 lbs. No action was taken, after bids were opened, they being held for examination into various makes.

Fairmount, Tenn.—City Commission has adopted ordinance providing for cement streets in Fairmount district.

Barre, Vt.—Partial motorization of street department is to be achieved through introduction of Jeffery army model truck, equipped with hand dump body. It is a 2-ton truck which city is purchasing, with a 4½x5½ four-cylinder motor. Price is \$3,100, f. o. b. Barre, chassis price being \$2,750, with \$350 additional for body.

Janesville, Wis.—At special meeting of Council Mar. 16 it was decided to have oils tested by the city engineer, C. V. Kerch, before the award is made. Prices are increased almost 50 per cent. over prices of last year, which was lowest on record. Six bids were received and opened. Standard Oil Co. bid \$5.04 for light oil and \$5.29 per 100 gallons for heavy oil. The Huastec Co. of New Orleans bid \$5.50 on high standard Mexican oil, which is very rich in asphaltic qualities. Indian Oil Co. put in two bids, one a straight bid of \$5.50 and the other scaling bid of 5 cts. with the price to increase or decrease according to rise or lowering of market. The sliding scale was to be based on one-eighth of cent a gallon, either up or down, as market was effected, 5 cts. on barrel of 42 gallons of oil. Last year a contract with the Indian Co. was \$3.34 for oil 85 to 90 per cent. asphalt. Commissioners were unable to obtain a guarantee that sliding scale price would not rise over \$5.50. Huastec Co. of straight \$5.50 may be considered if sufficient bonds will be put up by company to insure satisfactory shipments of oil. Bid of Standard Oil Co. is \$5.29 for heavy oil, and if their sample tests out as well as others, contract will probably go to this company.

Milwaukee, Wis.—Bids on about \$60,000 worth of street paving were opened by F. G. Simmons of department of public works. Contracts will be awarded to the lowest bidders whose prices are a few cents per sq. yd. lower than bids were a year ago. Lowest bids were submitted as follows: Deer Pl., from Howell to West St., bituminous concrete, bidder, Paul C. Koreck, \$7.165.15; Pennsylvania Ave., from Beulah Ave. to city limits, New York Ave., from Delaware Ave. to city limits; Meredith St. from Northwestern Ave. to Oklahoma Ave.; Superior St. from

Oklahoma Ave. to the south city limits; Delaware Ave. from Oklahoma to the south city limits, and Wyoming Pl. from Pennsylvania Ave. to Kinnickinnic Ave., bituminous concrete, same contractor, \$29,802; 33d St., from Burleigh to Climax subdivision, bituminous concrete, same contractor, \$6,993; Locust St. from 29th St. to Fond du Lac Ave., with brick, 3,163 sq. yds. at \$1.94, Mangen & McGucken, \$9,295.58; grading Sherman Blvd. from Wright to Center Sts., and North Ave. from 48th to 53d Aves., Emil Wolfgram, price \$5,260.

CONTRACTS AWARDED.

Washington, D. C.—Contract has been awarded to General Construction Co., Spokane, Washington, for grading 11 miles of the Mill A Underwood road in Skamania County at their bid of \$39,582.60. J. W. Ball is Highway Engineer.

Danville, Ill.—Contracts for construction of Vermillion County bond issue roads were awarded by County Board, March 17th, as follows: Div. 1, Harding & Slattery, Crawfordville, Ind., \$116,444; Div. 2, Granite City Lime & Cement Co., Granite City, Ill., \$172,393.44; Div. 3, A. D. Thompson, Peoria, Ill., \$113,953; Div. 4, Eclipse Const. Co., Winnetka, Ill., \$101,974.19; Div. 5, Prendergast-Clark Const. Co., St. Louis, Mo., \$124,800; Div. 6, M. J. Hanick, St. Louis, Mo., \$129,825; Div. 7, Granite City Lime & Cement Co., Granite City, Ill., \$132,947.60; Div. 8, P. M. Johnston & Co., St. Elmo, Ill., \$113,200; Div. 9, Ewing Shields & Co., Greencastle, Ind., \$161,315. P. C. McArdle is Superintending Engineer.

Elgin, Ill.—Contract has been awarded to Logan & Giertz Const. Co., local, for paving on Prairie St. at their bid of \$5,916.90.

Elgin, Ill.—Contract has been awarded to McCarthy Improvement Co., Danville, Ia., at \$15,593.98 for paving North Gifford St. with Sarco.

Elgin, Ill.—Contract for paving 11,800 sq. yds. on Grove Ave. was awarded to Logan & Giertz Const. Co., local, at \$132 for brick pavement on old foundation, asphalt fill, at 25 cts. for adjusting M. H. & C. B. at \$1.20 per sq. yd. for new foundation total bid \$15,719. Engineer's estimate was \$15,844. Other bidders were as follows: Ill. Hyd. Stone & Const. Co., local, at \$143.5 cts. and \$1, respectively; Ben. Gross, La Porte, Ind., at \$140, 50 cts. and \$1.25, respectively.

Indianapolis, Ind.—Contract was awarded to Indian Refining Co. to supply city with not less than 850,000 gallons of road oil to oil unpaved streets this year. Contract price was \$4.62 for each 100 gallons, lowest bid that was submitted. B. J. T. Jeup, city engineer, said that since board received bids price of crude oil has increased 10 cts. on each 100 gallons.

Asheville, N. C.—Board of Aldermen Mar. 14 let a contract for 3,000 sq. yds. of paving to Noll Construction Co., of Chattanooga, Tenn. Bids call for an 8-in. concrete base and a surface of sheet asphalt, giving what is considered one of the best roads in country. Board of County Commissioners recently donated \$30,000 to West Asheville for road purposes, and Aldermen have arranged for enough to make an expenditure of over \$65,000 for road work. Work on new road will begin immediately.

SEWERAGE

Muncie, Ind.—See "Streets & Roads."

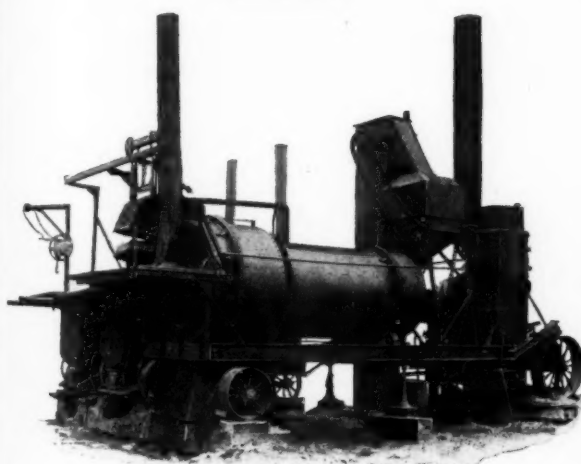
Pera, Ind.—Petition for lateral sewer between Washington St. and Euclid Ave. running from Wayne to Benton Sts. was granted.

St. Paul, Minn.—Preliminary orders for sewer, sidewalk and grading improvements were passed by City Council Mar. 14. Improvements ordered follow: Constructing sewer on Wakefield Ave. from point 133 ft. east of east line of Earl St. to Hester St. and on Hester St. from Wakefield Ave. to Hastings Ave.; constructing sidewalk on north side of Winter St. from Park Ave. to Capitol Heights; repairing sidewalk on north side of Edmund St. between Arundel St. and MacKubin St.; constructing storm water sewer on Como Ave. between Gaultier and Rice Sts. and on Rice St. from Sherburne Ave. to Winter St. Grading Dudley Ave. from Grantham St. to Chelmsford St.

Dunellen, N. J.—Special election will be held April 26 to vote on bond issue of \$45,000 to complete local sewer system.

Oriskany, N. Y.—Village contemplates construction of sewer system and sanitary sewage disposal plant at cost of \$40,000 money to be obtained by bond issue.

WARREN'S PORTABLE ASPHALT PLANT



Warren's Portable Asphalt Plant, Purchased and Operated
by City of Syracuse, N. Y., 1915

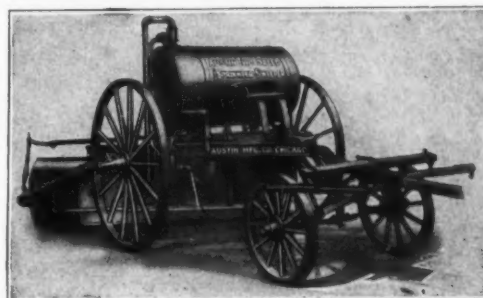
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PROPOSALS

NOTICE TO CONTRACTORS:—STATE OF NEW YORK. Office of the State Commission of Highways, Albany, N. Y.—Pursuant to the provisions of Chapter 30, Laws of 1909, as amended by Chapter 646, Laws of 1911, and Chapter 80, Laws of 1913, sealed proposals will be received by the Undersigned at the office of the State Commission of Highways, 55 Lancaster Street, Albany, N. Y., at 1 o'clock P. M. on Tuesday, March 28th, 1916, for furnishing and delivering bituminous materials "A," "T" and cold patch asphaltic emulsion in the different counties comprising Divisions Nos. 1, 2, 3, 4, 5, 6, 7, 8, and 9, BITUMINOUS MATERIAL CONTRACTS NOS. 1 to 25, inclusive. Tables and specifications showing the approximate quantities may be seen and obtained at the office of the Commission in Albany N. Y. The special attention of bidders is called to the fact that separate proposals will be received for each Division for furnishing and delivering bituminous materials "A," "T" and cold patch asphaltic emulsion as designated in detail by Divisions on tables prepared for that purpose.

Each proposal must be accompanied by a draft or certified check issued by a National or State Bank in good credit within the State and payable at sight to the order of the State Commission of Highways, for an amount equal to at least 5 per centum of the amount of the proposal which such draft or check accompanies. This draft or check will be held by the Commission until the contract is executed, and the bond is filed.

The successful bidder on each proposal will be required to give a bond for 50 per centum of the amount of the contract, such bond to be executed by a Surety Company to be approved by the Commission. The bond is for the purpose of insuring the delivery of the bituminous material as called for by the Commission.

The right is reserved to reject any or all bids.

EDWIN DUFFEY,
Commissioner.

I. J. MORRIS,
Secretary.

The City Council of Greenwood, South Carolina, will receive proposals for the purchase of Street Improvement City of Greenwood Assessment Certificates on Tuesday, March 28th, at 8 o'clock P. M. The said assessment certificates to be made in denominations to suit the purchaser, payable in New York or Chicago, and bearing interest at 6%. The said certificates to be of total issue not less than \$40,000, and not more than \$80,000. All those submitting proposals required to give certified check of \$1,000 as evidence of good faith.

A. S. HARTZOG, Mayor.

J. WILLIAMS WATSON, Clerk & Treasurer.

HIGHWAYS

SEALED BIDS will be received by the Board of Water Supply at its offices, twenty-second floor, Municipal building, Park Row, Centre and Chambers streets, New York City, until 11 A. M., on Tuesday, April 11, 1916, for Contract 171, for surfacing with bituminous macadam and vitrified brick blocks about 3 miles of highways at the Kensico reservoir, in the Town of Mt. Pleasant, Westchester county, New York. The grading for these highways has been largely done under other contracts.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, and contract drawings can be obtained at the above address at the office of the Secretary, by depositing the sum of ten dollars (\$10) in cash or its equivalent for each pamphlet. For further particulars apply to the office of the Principal Assistant Engineer at the above address.

CHARLES STRAUSS, President;

CHARLES N. CHADWICK,

JOHN F. GALVIN,

Commissioners of the Board of Water Supply.

GEORGE FEATHERSTONE, Secretary.

NOTICE TO CONTRACTORS

DEPARTMENT OF PUBLIC WORKS

South Bend, Indiana.

PAVEMENTS

Notice is hereby given that sealed proposals will be received by the Department of Public Works of the City of South Bend, Indiana, up to 10:00 A. M. of the 4th day of April, 1916.

27,916 sq. yds. of pavement on Michigan Street. Bids will be received on following types of pavement: Asphalt, Creosoted Wooden Blocks, Brick, Bitulithic on a 7-inch Portland cement concrete foundation.

34,050 sq. yds. of pavement on Indiana Avenue. Bids will be received on the following types of pavement: Brick, Asphalt, Asphaltic Concrete or Bitulithic laid on a five-inch cement concrete foundation.

Complete drawings and specifications of said work are now on file in the office of the Department of Public Works in the City Hall of South Bend, Indiana.

BOARD OF PUBLIC WORKS,

E. M. MORRIS,

A. H. RICE

JOHN B. WEBER

VERONICA C. SWEENEY, Clerk.

INVITATION FOR PROPOSALS.

TREASURY DEPARTMENT, Supervising Architect's Office, Washington, D. C., March 15, 1916.—SEALED PROPOSALS will be opened in this office at 3 p. m., May 8, 1916, for the construction of the United States Post Office at Elkins, W. Va. Drawings and specifications may be obtained from the Custodian of the site at Elkins, W. Va., or at this office, in the discretion of the Supervising Architect. Drawings and specifications will be ready for delivery after March 27, 1916. Jas. A. Wetmore, Acting Supervising Architect.

Sealed bids will be received by B. A. Wise, City Manager of the City of Charleston, West Virginia, until twelve o'clock noon, March 31st, 1916, for grading, curbing and paving twelve squares, amounting to 16,865 square yards.

For information address J. M. Clark, City Engineer, or

B. A. WISE,
City Manager.

OCEAN BEACH, LONG ISLAND, N. Y.

ANDREW J. PROVOST, Jr., Consulting Engineer, 39-41 West 38th Street, New York City, will receive bids until April 4th, 1916, for constructing sewers and sewage treatment works.

FOR SALE

One Demming Deep Well Pump with power head for motor drive, has 5-inch working barrel, 225-foot suction; will pump 86 gallons per minute against 350-foot head. In first-class condition, used about 6 months. Address, Superintendent Water Works, Barnesboro, Pa.

FOR SALE

One 10-ton macadam roller. Standard make. Condition fine. Good bargain. Write—Townsend Construction Company, c/o Municipal Journal.

FOR SALE

One "OO" Austin Trenching Machine with ten-foot extension, nearly new. Address J. E. Poin-dexter, Receiver, Fayetteville, Tennessee.

FOR SALE CHEAP

Wrought Pipe, second hand, all sizes, recut and rethreaded suitable for all classes of work. Prices quoted on application.

MARINE METAL & SUPPLY CO
167 South Street, New York City

WANTED

One macadam roller at a reasonable price. Size 10 tons. Send description and price to —Bennett Contracting Company, c/o Municipal Journal.

Massillon, O.—See "Streets & Roads." Philadelphia, Pa.—Preparatory to undertaking construction of first big unit of sewage disposal system of this city, for which an item of \$3,200,000 has been included in proposed \$86,800,000 loan, Director Datesman, of Department of Public Works caused to be introduced in Councils Mar. 16 an ordinance to authorize condemnation of a large tract of land adjacent to Delaware River, south of the Pennsylvania Railroad bridge, at about the line of Allen St. in Port Richmond. Ordinance will result in several streets being removed from city plan, between boundaries of Erie Ave. on south, Richmond on the west, Allen on north and Delaware Ave. to the east. Balfour, Wheatshaf lane, Carbon, Juniata, Orthodox and other streets are included within tract. City has constructed small plant at Torresdale, to intercept sewage of the Pennypack Creek. There is \$500,000 available for sewerage of Frankford Creek, which is partially under contract.

CONTRACTS AWARDED.

Kendallville, Ind.—For west and south main sewer to McLaughlin Construction Co., Pittsburgh, Pa., at \$26,219. Willis E. Sawyers is City Engr.

Hammond, Ind.—For sewer system in Calumet Ave. from river to Conkey Ave. to United Construction Co., at \$213,255. Peter J. Lyons is City Engr.

Fort Dodge, Ia.—Contracts have been let as follows for cement tile sewer: To J. W. Boyer, local, for open work, at 9.45 cts. per yd. (estimated 183,000 cu. yds.); to Jensen & Thomas, Dayton, Ia., labor laying tile at \$12,625.60; to Arthur McHose, Gowrie, Ia., cement tile, at \$23,840.20.

Cincinnati, O.—For house connections with sewer and water mains to Hollaender Plumbing Co., Cincinnati, at \$12,610. Frank Krug is City Engr.

WATER SUPPLY

Jacksonville, Fla.—Engineer E. C. Craig recommended purchase of system of pumps and other supplies for water works which will cost \$14,391.92. After some discussion recommendation was approved by board.

Fort Wayne, Ind.—County Commissioners Mar. 15 let contract for deep water pump and piping to supply county jail with well instead of city water. Contract went to A. Hattersley Co. on a bid of \$558. Other bids were: Thrasher & Herman, \$560; P. B. Arnold, \$571; Martin F. Noll, \$600; J. P. Martin, \$657; Loeffler Plumbing & Heating Co., \$709; Schwegman & Co., \$800.